

NATIONAL WEATHER SERVICE INSTRUCTION 10-503

***Operations and Services
Public Weather Services, NWSPD 10-5***

WFO PUBLIC WEATHER FORECAST PRODUCTS SPECIFICATION

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WSOM Chapter C-20, “National Public Weather Products,” Issuance 92-09, dated August 31, 1992 (*ref.* Coded City Forecast);
WSOM Chapter C-21, “Local and Regional Statements, Summaries, and Tables,” Issuance 92-10, dated August 31, 1992 (*ref.* Recreational Report);
WSOM Chapter C-45, “Meteorological Discussions and Forecast Coordination,” Issuance 94-12, dated September 28, 1994 (*ref.* State Forecast Discussion);
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Date

WFO Public Weather Forecast Products Specification

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1. **Introduction.** This procedural instruction provides product specifications for the main alphanumeric public products issued by National Weather Service (NWS) Weather Forecast Offices (WFOs). Specifications include the guidelines associated with these products, detailed content, and format for each product type. The NWS is in transition from providing weather forecast and warning information primarily via scheduled text products, to providing more detailed information as dictated by events via a mixture of alphanumeric products, digital data and graphics. Products covered in this instruction will eventually be prepared by automated formatters extracting information from a gridded forecast database. However, in the interim the following public products will be created using a mixture of traditional preparation methods and product formatters.

2. **Zone Forecast Product (product category ZFP).**

2.1 **Mission Connection.** The Zone Forecast Product (ZFP) is a text product issued by all WFOs to explicitly state expected weather conditions within each **zone** (a geographic location that has sufficient climatological and meteorological homogeneity to allow a single forecast to serve as the forecast for that area) in their geographic area of responsibility through Day 7. The ZFP is used by a wide variety of customers and partners such as the media, emergency managers, and the general public. It is primarily used as a tool for planning purposes to support and promote public health, commerce, and quality of life.

2.2 **Issuance Guidelines.**

2.2.1 **Creation Software.** Weather Forecast Offices (WFO) should produce the ZFP using software formatters requiring little or no post editing. WFOs may use text editors to create the ZFP where automated software formatters are not yet available.

2.2.2 **Issuance Criteria.** The ZFP is a dynamic product issued by all WFOs as events dictate to always depict the latest expected weather conditions through Day 7. Events may be local, regional, or national customer requirements.

2.2.3 **Issuance Time.** The ZFP is an event-driven product and may be issued at any time. However, at a minimum the ZFP will be issued twice daily to remove the outdated first period of the forecast. These mandatory issuance times will occur no later than 4:00 a.m. and 4:00 p.m. local time.

2.2.4 **Valid Time.** The ZFP is valid from the time of release through Day 7.

2.2.5 **Product Expiration Time.** The ZFP product expiration time is 15 hours from the initial time of issuance.

2.3 **Technical Description.** The ZFP will follow the format and content described in this section.

2.3.1 **Universal Geographic Code (UGC) Type.** The ZFP will use the (Z) form of the UGC.

2.3.2 Mass News Disseminator (MND) Broadcast Instruction Line. There is no MND Broadcast Instruction Line associated with this product.

2.3.3 MND Product Type Line. The Zone Forecast Product MND line is, “ZONE FORECASTS,” which may be followed by a descriptive area.

2.3.4 Format. The ZFP will follow the formats specified in Figures 1 and 2. The ZFP is divided into 13 distinct forecast periods for the early morning issuance, and 14 periods for the afternoon issuance. Each forecast period is a 12-hour block of time coinciding with either the daylight or nighttime hours.

<u>Product Format</u>	<u>Description of Entry</u>
FPaaii cccc ddhhmm ZFPxxx	WMO Heading AWIPS ID
ZONE FORECASTS (name of area - optional) NATIONAL WEATHER SERVICE CITY STATE time am time_zone day mon dd yyyy	NWS Product Name Issuing Office Issuance Local Time/Date
stZXXX-XXX>XXX-ddhhmm- county-county-county-county- INCLUDING THE CITIES OF city...city...city time am time_zone day mon dd yyyy	UGC Type (Zone) & Expir. Time County (or Zone) Names City Names Issuance Local Time/Date
...Long-duration watch/warning(s) or significant headline(s) as required...	
<i>Forecast Period</i>	<i>Valid times</i>
.TODAY...	(6am-6pm)
.TONIGHT...	(6pm-6am)
.DAY 2...	(6am-6pm)
.DAY 2 NIGHT...	(6pm-6am)
.DAY 3...	(6am-6pm)
.DAY 3 NIGHT...	(6pm-6am)
.DAY 4...	(6am-6pm)
.DAY 4 NIGHT...	(6pm-6am)
.DAY 5...	(6am-6pm)
.DAY 5 NIGHT...	(6pm-6am)
.DAY 6...	(6am-6pm)
.DAY 6 NIGHT...	(6pm-6am)
.DAY 7...	(6am-6pm)
.< TEMPERATURE / PRECIPITATION	Specific site forecast at
CITY 1 MAX MIN MAX / POP POP POP	Regional discretion
CITY 2 MAX MIN MAX / POP POP POP	
\$\$	UGC delimiter
NAME/INITIALS/FCSTR ID (optional)	
All times are local. Abbreviations and contractions, other than PM, AM, MPH and time zones (EST, CST, MDT, PST, etc.), are NOT allowed.	

Figure 1. Zone Forecast Product Format - Early Morning Issuance.

<u>Product Format</u>	<u>Description of Entry</u>
FPaaii cccc ddhhmm ZFPxxx	WMO Heading AWIPS ID
ZONE FORECASTS (name of area - optional) NATIONAL WEATHER SERVICE CITY STATE time pm time_zone day mon dd yyyy	NWS Product Name Issuing Office Issuance Local Time/Date
stZXXX-XXX>XXX-ddhhmm- county-county-county-county- INCLUDING THE CITIES OF city...city...city time pm time_zone day mon dd yyyy	UGC Type (Zone) & Expire. Time County (or Zone) Names City Names Issuance Local Time/Date
...Long-duration watch/warning(s) or significant headline(s) as required...	
<i>Forecast Period</i>	<i>Valid times</i>
.TONIGHT...	(6pm-6am)
.TOMORROW...	(6am-6pm)
.TOMORROW NIGHT...	(6pm-6am)
.DAY 2...	(6am-6pm)
.DAY 2 NIGHT...	(6pm-6am)
.DAY 3...	(6am-6pm)
.DAY 3 NIGHT...	(6pm-6am)
.DAY 4...	(6am-6pm)
.DAY 4 NIGHT...	(6pm-6am)
.DAY 5...	(6am-6pm)
.DAY 5 NIGHT...	(6pm-6am)
.DAY 6...	(6am-6pm)
.DAY 6 NIGHT...	(6pm-6am)
.DAY 7...	(6am-6pm)
.< TEMPERATURE / PRECIPITATION	Specific site forecast at
CITY 1 MIN MAX MIN MAX / POP POP POP POP	Regional discretion
CITY 2 MIN MAX MIN MAX / POP POP POP POP	
\$\$	UGC delimiter
NAME/INITIALS/FCSTR ID (optional)	
All times are local. Abbreviations and contractions, other than PM, AM, MPH and time zones (EST, CST, MDT, PST, etc.), are NOT allowed.	

Figure 2. Zone Forecast Product Format - Afternoon Issuance.

2.3.4.1 Combining Periods. The first period of the forecast must stand alone. All other forecast periods may be combined when weather elements (including winds and restrictions to visibility) are similar. Regional Headquarters will define weather element similarity, i.e., combination thresholds.

2.3.5 Content. The ZFP should always reflect the observed, imminent and/or expected weather conditions to affect specific zones or zone groupings. The ZFP includes headlines (when

applicable), and the following weather parameters: precipitation and probability of precipitation, sky condition, temperature, wind, and visibility restrictions. Wind and visibility restriction elements are optional beyond the fifth period. Forecast attention and detail should be focused on those periods where weather is most significant. Likewise, within each period, forecasts should be arranged to emphasize unusual or dangerous weather elements first. In these situations, sky condition or POPs may be omitted or rearranged to allow for the unusual or dangerous information to be highlighted. Forecast content is described in more detail in the following sections.

2.3.5.1 References to Holidays. Ten federally recognized U.S. national holidays and (Federal) will be used to identify the daytime zone periods instead of the days of the week (see Figure 3). These ten holidays refer to the actual day on which they occur.

NEW YEARS DAY	MARTIN LUTHER KING JR DAY	PRESIDENTS DAY
MEMORIAL DAY	INDEPENDENCE DAY	LABOR DAY
COLUMBUS DAY	ELECTION DAY	VETERANS DAY
THANKSGIVING DAY	CHRISTMAS DAY	

Figure 3. Federally Recognized Holidays and Election Day (Federal).

2.3.5.2 Headlines. Headlines will be brief and clearly convey complete ideas; they are not intended to convey great detail or serve as an alternative to other NWS forecast products. There are two types of headlines: *Long Duration Hazardous Weather*, and *Significant Weather*. WFOs will issue Long Duration Hazardous Weather Headlines whenever long duration hazardous weather conditions (as specified in Appendix B) are forecast to occur. WFOs may also issue Significant Weather Headlines, which add value to a forecast and include a reference to significant weather conditions as described in Appendix B.

When warranted, two or more headlines should be used. Headlines should be reserved for the first three days of the forecast (see Figures 4 and 5).

...NEAR RECORD LOW TEMPERATURES EXPECTED TONIGHT... <i>Significant</i>
...WINTER STORM WARNING IN EFFECT THROUGH LATE THIS AFTERNOON... <i>Long Duration Hazardous</i>

Figure 4. Singular Headline Examples.

...HEAVY SNOW WARNING IN EFFECT OVERNIGHT... <i>Long Duration Hazardous</i>
...HIGH WIND WATCH IN EFFECT WEDNESDAY AFTERNOON... <i>Long Duration Hazardous</i>
...HIGH SURF ADVISORY IN EFFECT TONIGHT... <i>Long Duration Hazardous</i>
...DANGEROUS RIP CURRENTS AT THE BEACHES TODAY... <i>Significant</i>

Figure 5. Multiple Headline Examples.

2.3.5.3 Precipitation and Probability of Precipitation (POP) Forecasts. Forecasts will describe expected measurable precipitation (0.01 inch) across each zone for all periods through Day 7. For stratiform weather situations, the POP range (to the nearest whole 10 percent) should extend from 20 to 100 percent. In convective weather situations, 10 percent may also be used to better describe isolated precipitation.

- a. Precipitation Events. Precipitation forecasts will specify the type and, as appropriate, qualify the intensity. Specify the approximate time of the beginning and ending of an extended period of precipitation when distinct and known. Place particular attention on specific timing for the first three periods.
- b. Precipitation Intensity. When forecaster confidence is high, precipitation should be described as “HEAVY” or “LIGHT”, which refers to either accumulation rate or restriction to visibility. For further details, see Appendix C - Federal Meteorological Handbook No. 1, Surface Weather Observations and Reports.
- c. Qualifying Terms. When POPs are separated from the precipitation element, qualifying terms will be used to aid public understanding. Qualifying terms will conform to the definitions found in Table 1 below.

POP	Qualifying Term	Equivalent Areal Term (convective only)
10	SLIGHT CHANCE or none	ISOLATED or none
20	SLIGHT CHANCE	ISOLATED
30 , 40 , 50	CHANCE	SCATTERED
60 , 70	LIKELY	NUMEROUS
80 , 90 , 100	none	none

Table 1. Qualifying and Equivalent Areal Terms.

An exception that justifies use of a lower POP is for those areas where isolated, high-based thunderstorms may (by virtue of their areal coverage or sub-cloud evaporation) result in any given area having only a slight chance (i.e., 10%) of measurable rainfall.

Do not combine **qualifying** and **areal** terms. For example, “NUMEROUS SHOWERS LIKELY” and “CHANCE OF SCATTERED SHOWERS” are improper forecasts. When POPs are categorical (80 percent or greater), duration qualifiers may be used to clarify the forecast (see Figure 6).

Brief - short; abrupt
Frequent - persistent short intervals
Occasional - occurring at irregular or infrequent intervals
Periods of - series of episodes
Intermittent - starting and stopping at intervals; not continuous

Figure 6. Duration Qualifiers.

Do not combine **Duration qualifiers** with **qualifying** or **areal** terms. For example, “CHANCE OF INTERMITTENT SHOWERS” and “FREQUENT SCATTERED THUNDERSTORMS” are improper.

- d. Mid-POP during the first period. WFOs should avoid using mid-range POPs (40-60%) during the first 12-hour period for non-convective precipitation. Mid-range areal POP terms (SCATTERED or NUMEROUS) may be used when forecasting convection (see Figure 7).

- 1) Non-convective precipitation event.
 .TODAY...RAIN LIKELY. HIGHS IN THE LOWER 60S. SOUTHEAST WINDS 5 TO 10 MPH. CHANCE OF RAIN 70 PERCENT.
 .TONIGHT...MOSTLY CLOUDY WITH A 50 PERCENT CHANCE OF RAIN. LOWS IN THE MID 50S. SOUTH WINDS 5 TO 15 MPH.
- 2) Convective precipitation event with a mid-range areal term POP.
 .THIS AFTERNOON...MOSTLY CLOUDY AND BREEZY WITH SCATTERED THUNDERSTORMS. HIGHS IN THE LOWER 80S. SOUTH WINDS 15 TO 25 MPH. CHANCE OF RAIN 40 PERCENT.

Figure 7. Convective/Non-Convective Precipitation Event Example Wording.

- e. Snowfall Accumulation. Quantitative snowfall accumulations (e.g., 2 inches, 6-10 inches) should be included in the first three periods of the forecast whenever the POP forecast is 60% or greater. If a snow event is forecast to end within the 3rd period, a storm total amount will be included in the final period the snow is forecast to end. If snow is forecast to begin or continue after the 3rd period, *generalized* quantitative snowfall amounts (e.g., up to 8 inches possible, greater than 6 inches possible), or descriptive terms such as “LIGHT,” “HEAVY,” or “ADDITIONAL ACCUMULATION(S)” should be used.

Snowfall accumulations should not be mentioned in the ZFP when the POP forecast is less than 60%, except in the following two instances:

- (1) Issuance of a Winter Storm Watch with a 50% POP (associated *generalized* quantitative snowfall amounts used) or;

- (2) When snow showers or squalls are forecast to produce localized snowfall accumulations (high probability of occurrence, but associated POP may be low as it refers to areal coverage).

Snow accumulations (quantitative or generalized quantitative) should not be used beyond the 4th period in the ZFP. If necessary, use descriptive terms instead.

- ...UP TO THREE INCHES OF SNOW THROUGH LATE THIS EVENING WITH BLOWING AND DRIFTING... **(OPTIONAL SIGNIFICANT WEATHER HEADLINE)**
- .TONIGHT...BLUSTERY WITH SNOW SHOWERS ENDING AROUND MIDNIGHT...THEN CLOUDY. BLOWING AND DRIFTING SNOW IS POSSIBLE. SNOW ACCUMULATION OF 1 TO LOCALLY 3 INCHES. LOWS 20 TO 25. NORTHWEST WINDS 15 TO 25 MPH.
- ...HEAVY SNOW WARNING IN EFFECT THROUGH FRIDAY MORNING WITH TOTAL SNOWFALL ACCUMULATION OF 10 TO 18 INCHES EXPECTED...
- .TODAY...BLUSTERY WITH HEAVY SNOW. SNOW ACCUMULATION 4 TO 8 INCHES. HIGHS IN THE UPPER 20S. NORTHEAST WINDS 15 TO 25 MPH.
.TONIGHT...SNOW...HEAVY AT TIMES. SNOW ACCUMULATION 6 TO 10 INCHES BY DAYBREAK. TEMPERATURES REMAINING STEADY. NORTHEAST WINDS AROUND 10 MPH BECOMING NORTHWEST LATE.
.FRIDAY...NUMEROUS SNOW SHOWERS ENDING IN THE MORNING. MOSTLY CLOUDY WITH FLURRIES IN THE AFTERNOON. STORM TOTAL ACCUMULATION 10 TO 18 INCHES. TEMPERATURES FALLING INTO THE MID 20S LATE IN THE DAY. NORTHWEST WINDS 10 TO 20 MPH. CHANCE OF SNOW 70 PERCENT.
.FRIDAY NIGHT...PARTLY CLOUDY. LOWS NEAR 15. NORTHWEST WINDS 10 TO 20 MPH.

Figure 8. Snowfall Headlines and associated Wording in Text.

- f. Precipitation Terminology. Precipitation terms used in the ZFP will conform with standard terminology found in FMH #1 (see Appendix C). In addition, use the following:
- (1) “Snow” instead of “snow pellets” or “snow grains”
 - (2) “Sleet” instead of “ice pellets”
 - (3) “Freezing rain” or “freezing drizzle” instead of “glaze”
- g. Mixed and Multiple Precipitation Types. The forecast should clearly indicate the probability of measurable precipitation -- not the chance of changing from one type of precipitation to another (see Figure 10). Avoid confusing wording implying the likelihood of changing to snow, e.g., “70 PERCENT CHANCE OF RAIN CHANGING TO SNOW.”
- h. Cases Where No POP Value is Required. A POP value is not required when:
- (1) Zone forecasts include the optional in-line point forecasts for specific cities.

- (2) Precipitation is occurring.
- (3) Terrain is topographically complex. (e.g., mountains, plateaus).
- (4) The POP value is 80 percent or greater.
- (5) The POP value is less than 20 percent.
- (6) For trace precipitation events.

Terms such as dry thunderstorms, sprinkles, drizzle, flurries, etc., may be used to imply very light precipitation resulting in trace events. During events of prolonged drizzle or flurries that can produce measurable precipitation, include a POP.

- i. Trace Events. Trace precipitation events (e.g., drizzle and snow flurries) are non-measurable events. Therefore, a POP statement should not be used. Instead, qualifying terms should be used to indicate the likelihood of precipitation not expected to produce measurable quantities (see Figure 9) .

► Examples of acceptable wording include:

"OCCASIONAL DRIZZLE" or "DRIZZLE THIS MORNING"
 "SCATTERED SNOW FLURRIES" or "SNOW FLURRIES LIKELY"

Figure 9. Acceptable Wording Examples for Trace Events.

- j. Precipitation Presentation Methods. The POP statement may be worded in a variety of ways (see Figure 10).
- (1) Use the equivalent term "Chance" or "Probability of Precipitation" when using a separate POP statement.
 - (2) Use specific precipitation types (e.g., rain, snow, etc.).
 - (3) Use the term "Precipitation" where precipitation type is uncertain, or for mixed or certain multiple precipitation events (e.g., sleet and rain, etc.).

► Separate POP statement at the end of the period

.TODAY...CLOUDY WITH SCATTERED SHOWERS ENDING IN THE MORNING...THEN BECOMING PARTLY SUNNY. HIGHS IN THE MID 70S. SOUTHEAST WINDS 10 TO 20 MPH. CHANCE OF RAIN 40 PERCENT.

► POP statement as part of forecast narrative

.FRIDAY...MOSTLY CLOUDY. A 50 PERCENT CHANCE OF SHOWERS AND THUNDERSTORMS. HIGHS NEAR 80. SOUTHEAST WINDS 5 TO 15 MPH.

► Precipitation with categorical (80 percent or greater) POP

.SATURDAY NIGHT...OCCASIONAL RAIN. LOWS IN THE UPPER 30S. EAST WINDS 5 TO 15 MPH.

► Trace events (no POP)

.TONIGHT...CLOUDY WITH AREAS OF DRIZZLE AND FOG. LOWS IN THE UPPER 40S. SOUTH WINDS 5 TO 10 MPH.

► Mixed and multiple precipitation

.TONIGHT...RAIN LIKELY...BECOMING MIXED WITH SNOW AFTER MIDNIGHT. LOWS IN THE LOWER 30S. NORTH WINDS 10 TO 15 MPH. CHANCE OF PRECIPITATION 70 PERCENT.

.TODAY...SNOW AND SLEET...CHANGING TO FREEZING RAIN BY NOON. SNOW ACCUMULATION 3 TO 6 INCHES. HIGHS IN THE LOWER 30S. NORTHEAST WINDS 5 TO 15 MPH.

Figure 10. POP Statement Examples.

2.3.5.4 Sky Condition. Each forecast period will include a predominant sky condition as shown in Table 2. **Exception:** The sky condition element is optional when the POP is greater than or equal to 60% and precipitation is expected to occur for the majority of the forecast period.

Day Only	Day or Night	Predominant Sky Condition (Opaque Cloud Coverage in Percent)
SUNNY	CLEAR	0 to ≤ 6% coverage
MOSTLY SUNNY	MOSTLY CLEAR	> 6% and ≤ 31% coverage
PARTLY SUNNY	PARTLY CLOUDY	> 31% and ≤ 69% coverage
MOSTLY CLOUDY, CONSIDERABLE CLOUDINESS	MOSTLY CLOUDY, CONSIDERABLE CLOUDINESS	> 69% and ≤ 94% coverage
CLOUDY	CLOUDY	> 94% and ≤ 100% coverage

Table 2. Predominant Sky Condition Thresholds.

Sky Condition Presentation Methods. Sky Condition will be presented in one of the following formats shown in Figure 11.

► No precipitation in the forecast

.TONIGHT...PARTLY CLOUDY. LOWS IN THE MID 30S. SOUTH WINDS 5 TO 10 MPH.

► Precipitation is included in the forecast, but the POP is less than 60 percent (third period forecast)

.FRIDAY...MOSTLY CLOUDY WITH A CHANCE OF SNOW. HIGHS IN THE UPPER 20S. NORTHWEST WINDS 10 TO 15 MPH. CHANCE OF SNOW 50 PERCENT.

► A sky condition term may be omitted if the POP is 60 percent or greater and the precipitation event is expected to occur for most of the forecast period

.SATURDAY...RAIN LIKELY. HIGHS IN THE UPPER 70S. SOUTH WINDS 5 TO 15 MPH. CHANCE OF RAIN 60 PERCENT.

Figure 11. Sky Condition Presentations.

2.3.5.5 Temperature. Each forecast period will include the expected high or low temperatures.

a. Temperature Presentation Methods. Temperatures will be presented in one of the following formats:

- (1) Implied range terminology. NEAR and AROUND are defined as plus or minus 2 degrees about a certain number. NEAR FREEZING is also permitted. For example, LOWS AROUND 40 means 38 to 42 inclusive.

- (2) A range as defined by the following examples (Regional guidance may alter these ranges based upon topography):

LOWER 50S (50, 51, 52, 53, 54)

MID 50S (53, 54, 55, 56, 57)

UPPER 50S (56, 57, 58, 59)

- (3) A specific range of 5 degrees (5 to 10 degrees in mountainous areas), unless specified by regional guidance:

LOWS 20 TO 25

HIGHS 47 TO 52

Care must be taken when using a temperature range format. Too many numbers may confuse the user. Keep the range as small as possible (see Table 3).

<u>Use</u>	<u>Avoid</u>
HIGHS AROUND 60	HIGHS IN THE UPPER 50S TO LOWER 60S
LOWS IN THE LOWER 40S	LOWS AROUND 40 TO THE LOWER 40S
HIGHS 25 TO 30	HIGHS IN THE MID TO UPPER 20S
LOWS 66 TO 71	LOWS IN THE MID 60S TO LOWER 70S

Table 3. Recommended Temperature Terminology.

- b. Non-diurnal Temperature Trends. If the temperature is forecast to fall during the day, rise during the night, or remain steady; indicate the temperature expected at the end of the period. Use phrases such as "STEADY", "FALLING", or "RISING TEMPERATURES" to help explain the situation. For example, "TEMPERATURES FALLING INTO THE UPPER 40S LATE THIS AFTERNOON."
- c. Hundreds, and Sub-Zero Temperatures. Avoid using the term "LOWER 100s." Lower 100s could be thought to mean "100 to 133." Use a specific range. Use specific numeric ranges for sub-zero temperatures presented as a mirror image around zero. For example, 5 below to 10 below zero, not 10 below to 5 below zero. Sub zero temperatures should be written out as "20 BELOW" or "MINUS 5" and preceded by a "--" sign in the site-specific forecast.
- d. Extreme Temperature Conditions. Wind Chill and Heat Index values will be included in the forecast and/or headlines in accordance with the criteria established by Regional Headquarters' policy.

2.3.5.6 Wind. Wind direction and speed will be included in the first five periods of the zone forecast (regional guidance may alter wind forecast requirements for areas having complex terrain). Deterministic winds (specific wind direction and speed) should only be referenced beyond the fifth period in the ZFP when those later forecast periods are combined with periods 2 through 5. In these cases, a single wind speed and direction (which applies to all combined periods) is provided in the forecast narrative.

A descriptive term or phrase will be used in the forecast narrative in any period where the wind is expected to be significant (e.g., 15 to 25 MPH or greater). Acceptable descriptive terms are shown in Table 4 below. These terms may be locally or regionally adjusted for climatology, except for those terms linked to warning definitions (e.g., hurricane warning).

- a. Wind Direction. Wind direction will reference the location from which the wind is blowing. It is denoted by the eight points of the compass: NORTH, NORTHEAST, EAST, SOUTHEAST, SOUTH, SOUTHWEST, WEST, and NORTHWEST. Changes in direction should be forecast. A range of wind directions should be avoided (e.g., use NORTHWEST rather than WEST TO NORTHWEST). Express wind direction without the use of a suffix (e.g.,

SOUTH instead of SOUTHERLY). Wind direction terminology that is well-known to the local customers is also acceptable. For example, in tropical regions, the wind direction may be referred to as “TRADES.” Additionally, terms such as “SEA BREEZE,” “LAKE BREEZE,” “ONSHORE WINDS,” and “DOWNSLOPE WINDS” are permitted.

- b. Wind Speed. Wind speed will be expressed in miles per hour, abbreviated "MPH." A speed range may be given. The largest desired range is 10 mph. Ranges up to 20 mph may be used for strong wind events. The wind speed should be rounded to the nearest 5 MPH.

Sustained Wind Speed Range (MPH)	Descriptive Term or Phrase
0 to 5	Light, Light and variable, or Calm
5 to 15	(None used)
10 to 20	(None used)
15 to 25	Breezy (mild temperatures) Brisk (cold temperatures) Blustery (cold and with frequent gusts)
20 to 30	Windy
25 to 35	Windy
30 to 40	Very Windy
35 to 45	Very Windy, Strong Winds
40 to 73	Strong Winds, Damaging Winds, Dangerous Winds, High Winds
74 or greater	Hurricane Force

Table 4. Acceptable Descriptive Terminology for Wind.

- c. Gusts. Wind gusts should be included when they are forecast to exceed the sustained wind speed by at least 10 MPH. Gusts are not included when sustained wind speeds are forecast to remain below 10 mph. An upper limit to the gusts should be included.
- d. Tropical Cyclones and other Extreme Events. During extreme wind events (e.g., hurricane, Nor'easter) where substantial uncertainty in wind speed exists, forecasters should ensure collaboration with surrounding offices and/or the tropical cyclone centers.

Tropical cyclone centers are the official sources for tropical cyclone forecasts, watches, and warnings. When a WFO's geographical area of responsibility falls within a tropical cyclone center watch or warning, the WFO should collaborate

winds and issue forecasts consistent with the respective tropical cyclone center's products.

- e. Wind Presentation Methods. Present wind forecasts in one of the following formats shown in Figure 12.

► Sustained wind as a range or single value

EAST WINDS 5 TO 15 MPH.
WEST WINDS 20 TO 30 MPH...BECOMING NORTHWEST AND DECREASING TO AROUND 10 MPH IN THE EVENING.

► Sustained wind range and gust statement – Avoid use of the general wind descriptor term “gusty.” Instead, provide the customer with a specific upper limit of wind gust magnitude.

SOUTH WINDS 40 TO 60 MPH WITH GUSTS TO 90 MPH POSSIBLE NEAR THE HEADLANDS.

NORTHWEST WINDS 15 TO 25 MPH WITH GUSTS TO 35 MPH.

► Wind speed trend

SOUTH WINDS DECREASING TO 30 MPH WITH GUSTS TO 45 MPH.

► Light and variable winds (usually 5 mph or less)

LIGHT [direction] WINDS
LIGHT AND VARIABLE WINDS
LIGHT WINDS
CALM WINDS

Figure 12. Wind Presentation Methods.

2.3.5.7 Visibility Restrictions. Forecasts will include visibility restrictions, such as fog, haze, smoke, blowing snow, blowing dust and volcanic ash; when visibilities are forecast to be less than or equal to 1/4 mile through the first five periods of the ZFP. Visibility restrictions may be included in the forecast text for visibilities greater than 1/4 mile up to 6 miles, based on local user requirements.

- a. Visibility Restrictions Presentation Method. When fog, haze, smoke, blowing snow, blowing dust or volcanic ash is occurring or is forecast to reduce the visibility to 1/4 mile or less; describe the visibility obstruction and its corresponding reduced distance within the body of the forecast text. Areal coverage terms that will be used to describe restrictions to visibility are: PATCHY, AREAS, and WIDESPREAD (see Appendix B - Definitions and General Terminology).

Visibility restriction forecasts will be presented in a format similar to the examples shown in Figure 13.

- ▶ ...DENSE FOG ADVISORY IN EFFECT OVERNIGHT INTO EARLY FRIDAY MORNING...

...TONIGHT...CLEAR EARLY. WIDESPREAD DENSE FOG DEVELOPING AFTER MIDNIGHT. VISIBILITIES DECREASING TO LESS THAN ONE QUARTER OF A MILE. LOWS IN THE MID 40S. CALM WINDS.
- ▶ ...DUST STORM WARNING IN EFFECT THROUGH LATE THIS AFTERNOON...

...TODAY...VERY WINDY WITH AREAS OF BLOWING DUST. VISIBILITIES MAY BE REDUCED TO AROUND 1/4 MILE AT TIMES. HIGHS AROUND 80. NORTHWEST WINDS 30 TO 40 MPH WITH GUSTS TO 50 MPH.

Figure 13. Visibility Restriction Presentation Examples.

2.4 Updates, Amendments and Corrections. Forecasts will be updated and corrected when the on-duty forecast team believes the current forecast is not representative, or when format or content errors are detected. When updating or correcting a ZFP, the entire zone package should be re-transmitted to ensure proper dissemination to our users.

Updated and corrected forecasts will include the appropriate "BBB" group in the WMO communications header. Amended and corrected forecasts are counted ("lettered") independently. Subsequent amendments and corrections for the same zone forecast package are incremented to the next letter of the alphabet "(i.e., AAA to AAB...AAX, CCA to CCB...CCX)." Table 5 illustrates the procedures for corrected and amended forecasts.

TIME (Local)	ZFP Issued	BBB Group
400 AM	Early Morning ZFP	None
440 AM	First Correction to ZFP	CCA
930 AM	First Update to ZFP	AAA
1130 AM	Second Update to ZFP	AAB
130 PM	Third Update to ZFP	AAC
400 PM	Afternoon ZFP	None
930 PM	First Update to ZFP	AAA

Table 5. Updated and Corrected Forecasts and "BBB" Group.

2.4.1 ZFP Update. The ZFP should be kept current to continually reflect the latest weather conditions for our "push" and "pull" customers. Therefore, updates should be issued whenever observed conditions are not accurately represented, or expected conditions are not reflected in the forecast. Rapidly changing weather conditions may require multiple forecast updates.

Updates should be issued as frequently as necessary (without limitation) to maintain a continuously current forecast. An example of the updated product format is shown in Figure 14.

Two basic rules have been established to provide forecast update guidance. They are not intended to be all encompassing and should be used with the understanding that written instructions cannot address every possible circumstance. At a minimum, WFOs will update the zone forecast under the following circumstances:

- a. Any long duration (in effect for three hours or more) watch, warning, or advisory is issued (or canceled) for any part of the forecast area.
- b. Any element in the gridded forecast database domain is unrepresentative of the expected or current conditions including: precipitation (timing, type, accumulation, and intensity), sky cover, wind (direction and speed), temperature (value or trend) and/or restrictions to visibility.

- Second ZFP update for a Severe Thunderstorm Watch. Notice the location of AAB, UPDATED, and brief description for the update.

FPUS54 KSJT 131712 **AAB**
ZFPSJT

ZONE FORECASTS FOR WEST CENTRAL TEXAS...**UPDATED**
NATIONAL WEATHER SERVICE SAN ANGELO TX
1112 AM CST TUE FEB 13 2001

TXZ049-054-098-099-113-114-127-128-132300-
CALLAHAN-FISHER-HASKELL-JONES-NOLAN-SHACKELFORD-TAYLOR-THROCKMORTON-
INCLUDING THE CITIES OF...ABILENE...ALBANY...ANSON...BAIRD...
HASKELL...ROBY...SWEETWATER...THROCKMORTON
1112 AM CST TUE FEB 13 2001

UPDATED FOR A SEVERE THUNDERSTORM WATCH

...SEVERE THUNDERSTORM WATCH IN EFFECT UNTIL 5 PM CST...

.THIS AFTERNOON...SCATTERED THUNDERSTORMS...SOME SEVERE WITH DAMAGING WINDS
AND LARGE HAIL. MOSTLY CLOUDY WITH HIGHS 80 TO 85. SOUTH WINDS 15 TO 20
MPH. CHANCE OF RAIN 50 PERCENT.

Figure 14. ZFP Update Example.

2.4.2 ZFP Correction. Correct forecasts for informational, grammatical, typographical and format errors. If an error is found after transmission, correct the error using the format shown in Figure 15.

- First ZFP correction for a typographical temperature error. Notice the location of “CCA,” “...CORRECTED,” and brief description of the correction.

FPUS54 KFWD 131600 CCA
ZFPFTW

ZONE FORECASTS...CORRECTED
NATIONAL WEATHER SERVICE FORT WORTH TX
1000 AM CST TUE FEB 13 2001

TXZ117>120-131>134-144>146-132215-
BOSQUE-DALLAS-ELLIS-HILL-HOOD-JOHNSON-NAVARRO-PARKER-ROCKWALL-SOMERVELL-
TARRANT-
INCLUDING THE CITIES OF...CLEBURNE...CORSICANA...DALLAS...FT WORTH...
GLEN ROSE...GRANBURY...HILLSBORO...MERIDIAN...ROCKWALL...WAXAHACHIE...
WEATHERFORD
1000 AM CST TUE FEB 13 2001

CORRECTED FOR TYPOGRAPHICAL TEMPERATURE ERROR

.THIS AFTERNOON...PARTLY CLOUDY. HIGHS IN THE LOWER 60S. NORTHWEST WINDS
AROUND 10 MPH.

Figure 15. ZFP Correction Example.

3. Area Forecast Matrices (product category AFM).

3.1 Mission Connection. The Area Forecast Matrices (AFM) product displays various weather parameters for forecast areas specified in the valid ZFP at 3-hour, 6-hour, and/or 12-hour intervals. The AFM is intended for use by large volume users of NWS forecast information and for use by the general public. The quasi-static matrix format of the AFM allows for rapid visual scanning of a large number of forecast parameters/values. In addition, the forecast data is decodable by computers for those who wish to create derived products. Information in the AFM is provided to customers and partners as supplemental detail and/or higher resolution detail than can be found in other standard NWS products. Through the AFM product, the NWS strives to improve communications to the public and hazards community, increase forecast resolution, provide customers the information on which they can base their decisions, and increase forecast and warning accessibility by all customers.

3.2 Issuance Guidelines.

3.2.1 Creation Software. This product is created using the Advanced Weather Interactive Processing System (AWIPS) Interactive Forecast Preparation System (IFPS) software.

3.2.2 Issuance Criteria. The AFM is an *optional* dynamic product issued for all forecast areas contained in the valid ZFP. The AFM should be issued whenever necessary to always depict the latest expected weather conditions through Day 7.

3.2.3 Issuance Time. The AFM is an event-driven product and may be issued at any time. However, at a minimum the AFM will be issued twice daily to remove the outdated first period

of the forecast. These mandatory issuance times will occur no later than 4:00 a.m. and 4:00 p.m. local time.

3.2.4 Valid Time. The AFM is valid from the time of release through Day 7.

3.2.5 Product Expiration Time. The AFM product expiration time is 15 hours from the initial time of issuance.

3.3 Technical Description. AFMs should follow the format and content described in the following section.

3.3.1 UGC Type. The AFM will use the (Z) form of the UGC.

3.3.2 MND Broadcast Instruction Line. AFMs do not contain an MND Broadcast Instruction Line.

3.3.3 MND Product Type Line. The Area Forecast Matrices MND line is, “AREA FORECAST MATRICES.”

3.3.4 Content. The following section describes the detailed content of the AFM product.

3.3.4.1 Date/Time Block. Below the product issuance time/date (headline, if present), the forecast date and time blocks will be displayed. The day of the week will be expressed by the standard 3-letter identifiers (SUN, MON, TUE, WED, THU, FRI, SAT) followed by the month, day and year (MM/DD/YY). The day and date labels are left justified above the 6:00 a.m. local time hour.

The following two lines provide the forecast times at 3 hour intervals (indicated by 3HRLY) out to 60 hours (2 ½ days) into the future. Listed on the far left of the time lines are the 3-letter time zone abbreviations (e.g. UTC, EST etc.). The Universal Time Coordinate (UTC) will always be listed on the first line, followed by the local time for the area covered by the AFM. In this example, the “EST 3HRLY” indicates that the time zone is Eastern Standard Time (EST), and the minimum forecast interval for any parameter is 3 hours.

The second block is valid from 66 hours through Day 7. Once again, the local time zone is EST, but the time interval is no longer 3 hours. Forecast parameters are valid for time intervals of at least 6 hours (indicated by 6HRLY), otherwise for 12 hours (see Figures 18 and 19).

DATE	MON 02/12/01								TUE 02/13/01								WED 02/14/01							
UTC 3HRLY	08	11	14	17	20	23	02	05	08	11	14	17	20	23	02	05	08	11	14	17	20	23		
EST 3HRLY	03	06	09	12	15	18	21	00	03	06	09	12	15	18	21	00	03	06	09	12	15	18		
DATE	THU 02/15/01						FRI 02/16/01						SAT 02/17/01						SUN 02/18/01					
UTC 6HRLY	05	11	17	23	05		11	17	23	05		11	17	23	05		11	17	23	05				
EST 6HRLY	00	06	12	18	00		06	12	18	00		06	12	18	00		06	12	18	00				

Figure 18. AFM Date/Time Block.

3.3.4.2 Forecast Parameters. The following AFM forecast parameters are listed in order of their appearance within the product. All elements are mandatory for a defined time period unless otherwise noted. However, precipitation type parameters are independent and will only appear in either the 3HRLY or 6HRLY block when forecast. Other elements such as wind chill and heat index are seasonal as defined by the local office. Watch, Warning, and Advisory information will also appear only when forecast.

- a. MAX/MIN. *(Alternatively labeled as MIN/MAX for afternoon issuance)*
A forecast of maximum or minimum temperatures in degrees Fahrenheit (F). The MAX temperature is valid for the period 7:00 a.m. through 7:00 p.m. local standard time, and “MIN” is valid for 7:00 p.m. through 8:00 a.m. local standard time (note that due to a 3-hour minimum time resolution, this element is right justified in the column beneath the *approximate* ending time of the MAX/MIN period). The nighttime MIN and daytime MAX may be displayed as single integer (e.g., -2, 8, 53, 102) , or as a range (e.g., 54 56 60) if the MAX/MIN temperatures are expected to vary across the area. For example, in Figure 19 a temperature range of 36 to 39 degrees is forecast for a nighttime minimum on Monday 2/12/01. In AFM area forecasts, the middle number within the range is the representative single value for that area. *MAX/MIN is forecast out through Day 7.*
- b. TEMP. TEMP is a snapshot of the expected temperature in degrees F valid at the indicated hour. The temperature is right justified in the column below the hour to which it refers. For example, in Figure 19 the forecasted temperature for 6:00 a.m. EST Wednesday 02/14/01 is 46 degrees F. *TEMP is available at 3-hour projections through 60 hours, then 6-hour projections through Day 7.*
- c. DEWPT. DEWPT is a snapshot of the expected dew point temperature in degrees F for the same time periods as its corresponding temperature forecast. DEWPT is located directly below the temperature line.
- d. RH. The relative humidity (RH) is a snapshot of the expected RH for the same time periods as its corresponding temperature and dew point forecast. The RH row is located directly below the “DEWPT” row. For example, in Figure 19 the RH at 3:00 p.m. (1500 hours) on 02/12/01 is based on a temperature of 46 degrees F and a dew point of 22 degrees F. The RH is 38%. *RH is available at 3-hour projections through 60 hours.*
- e. WIND DIR. WIND DIR is a snapshot of the expected wind direction forecast to occur at the indicated hour, using the 8 points of a compass (i.e., N, NE, E, SE, S, SW, W, NW). For example, in Figure 19 the forecasted prevailing wind direction, i.e., the direction from which the wind is blowing, at 9:00 a.m. EST Monday 02/12/01 is Northwest (NW). If a calm wind is forecast, double zeros (00) will be listed in place of a wind direction. WIND DIR is located below the hour to which it refers. *WIND DIR is available at 3-hour projections out to 60*

hours. (Note special exception to wind direction for tropical cyclones in section 3.3.4.3.)

In the 6HRLY block, **PWIND DIR** is the “predominant” wind direction for the area during the 12-hour period between 6:00 a.m. and 6:00 p.m., or 6:00 p.m. and 6:00 a.m. local time. *PWIND DIR is available beyond 60 hours through Day 7.*

- f. WIND SPD. WIND SPD is a snapshot of the sustained wind speed in miles per hour (MPH) forecast to occur at the indicated hour. For example, in Figure 19 the forecasted wind speed at 3:00 p.m. (1500 hours) EST Tuesday 02/13/01 is 36 MPH. If a calm wind is forecast, double zeros (00) will be listed in place of a wind speed. (Note special exception to wind speed for tropical cyclones in section 3.3.4.3) *WIND SPD is valid at 3-hour projections out to 60 hours.*

WIND CHAR codes are used beyond 60 hours through Day 7 of the forecast and denote the character of the wind for the 12-hour period between 6:00 a.m. and 6:00 p.m., or 6:00 p.m. and 6:00 a.m. WIND CHAR is comprised of range categories used in conjunction with deterministic wind speeds. Each range category is equated to a descriptive wind term, i.e., a “wind character” to best describe the MAXIMUM SUSTAINED wind speed during the period. For example, in Figure 19, on Saturday 02/17/01 during the 12-hour period between 6:00 a.m. and 6:00 p.m., the AFM code “WY” indicates that the period is expected to be “WINDY” with maximum sustained speeds in the range of 23 to 30 mph. See Table 6 below for the complete list of AFM wind categories.

Wind Character Codes	Wind Character	12-hr Maximum Sustained Wind Speed
LT	Light	< 8 mph
GN	Gentle	8 - 14 mph
BZ	Breezy	15 - 22 mph
WY	Windy	23 - 30 mph
VW	Very Windy	31 - 39 mph
SD	Strong/Damaging	≥ 40 mph

Table 6. AFM Wind Character Codes.

- g. WIND GUST. A wind gust row will appear in the 3HRLY block whenever forecasted wind gusts exceed the sustained wind speed (WIND SPD) by at least 10 MPH. WIND GUST is a snapshot valid on the hour indicated at the top of the corresponding column. For example, in Figure 19, the maximum wind gust at 6:00 p.m. (1800 hours) EST Tuesday 02/13/01 is forecast to be 52 MPH. *WIND*

GUST is a snapshot of gusts of wind occurring at the indicated hour and is available at 3-hour projections through 60 hours. (Note special exception to wind gust for hurricanes in section 3.3.4.3)

- h. **CLOUDS.** The CLOUDS category provides a snapshot of sky coverage during the indicated hour. CLOUDS is divided into five category codes ranging from clear to overcast. Each code represents an equivalent percentage of opaque sky cover in percent. *CLOUDS parameter is included at 3-hour projections out to 60 hours.* In the 6HOURLY section, AVG CLOUDS is valid for 6-hour intervals beyond 60 hours through Day 7 and denotes the average amount of all clouds during the 6-hour period ending on the hour indicated at the top of the column. The complete cloud codes and equivalent sky cover definitions are shown in Table 7.

AFM Sky Cover Code	Sky Cover Expression	Equivalent Percent Opaque Sky Cover
CL	Clear/Sunny	0% to \leq 6%
FW	Mostly Clear/Mostly Sunny	> 6% and \leq 31%
SC	Partly Cloudy/Partly Sunny	>31% and \leq 69%
BK	Mostly Cloudy	>69% and \leq 94%
OV	Cloudy	>94% and \leq 100%

Table 7. AFM Sky Cover Codes.

- i. **POP 12HR.** Probability of Precipitation (POP), is defined as the likelihood, expressed as a percent, of a measurable precipitation event (1/100th of an inch) at any given point within the forecast area(s) covered by the AFM. The “12HR” refers to the 12-hour valid time ending at 6:00 a.m. or 6:00 p.m. local time (0600 or 1800). The POP 12HR values that may appear in the AFM are as follows: 0, 5, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100. These values are right justified in the column beneath the hour defining the ending time of the valid period. In Figure 19, there is a 70% chance of precipitation during the 12-hour period between 6:00 p.m. EST Tuesday 02/13/01 and 6:00 a.m. EST 2/14/01. *POP 12HR is forecast through Day 7.*
- j. **QPF 12HR.** This parameter, quantitative precipitation forecast (QPF) represents the total amount of liquid precipitation, in inches, expected during a 12-hour period ending at 6:00 a.m., or 6:00 p.m. local time at any point in the forecast area. The QPF is presented in locally defined ranges, (e.g., .10-.24), or single values. The QPF 12HR value is right justified in the column beneath the hour defining the ending time of the expected precipitation. For example, in Figure 19, the QPF 12HR indicates that a total of .25-.49 inches of precipitation is

expected sometime during the period beginning at 6:00 p.m. EST Tuesday 2/13/01 and ending at 6:00 a.m. EST Wednesday 2/14/01. *QPF 12HR is forecast out to 60 hours.*

- k. MAX QPF (optional). The value for MAX QPF value is the estimated maximum amount of precipitation, in inches occurring at any point within the forecast area during the 12-hour period ending at 6:00 a.m. or 6:00 p.m. local time. This amount is presented as either a single value or a range, and is based upon a 75% confidence level of the QPF forecaster(s). MAX QPF is right justified below the hour defining the ending time of the expected precipitation, and is *available out to 60 hours.*
- l. SNOW 12HR. The expected range of total snowfall accumulation (in whole inches) forecast to occur in the forecast area during a 12-hour period ending at 6:00 a.m. or 6:00 p.m. local time. SNOW 12HR will only appear during the locally defined winter period. The snow parameter contains 1 to 5 alphanumeric characters which are right justified in the column below the hour defining the *ending time* of the precipitation period. SNOW 12HR may appear as a one or two digit number (1, 4, 12), or as a specified range (2-4, 8-12). When no snowfall is forecast during the locally specified winter period, double zeros (00-00) will appear in the row. Snowfall that is not measurable (less than 0.1 inch of frozen precipitation) is referred to as a trace. A trace of snow is depicted by a "T." *SNOW 12HR is forecast out to 36 hours.*
- m. PRECIPITATION TYPE AND CATEGORY. The AFM may list several types of precipitation. Precipitation types only appear in the AFM if they are forecast to occur in the specified area during the seven day forecast. Precipitation type codes are listed in the far left column of the AFM. For each type of precipitation that is forecast, an associated POP category is specified within the body of the product. During the first 60 hours, the POP category for the indicated precipitation type is a snapshot valid at the hour specified by the column header. Beyond 60 hours through Day 7, the POP category reflects the prevailing POP during the 6-hour period including and preceding the hour indicated at the top of the column. PTYPE and Category is available at *3-hr projections out to 60 hours, then for 6-hour periods beyond 60 hours through Day 7.* The types of precipitation that may be forecast in the AFM are shown in Table 8.

AFM Code	Sensible Weather
RAIN	Rain
RAIN SHWRS	Rain Showers
SPRINKLES	Sprinkles
TSTMS	Thunderstorms

DRIZZLE	Drizzle
SNOW	Snow
SNOWSHWRS	Snow Showers
FLURRIES	Snow Flurries
SLEET	Ice Pellets
FRZG RAIN	Freezing Rain
FRZG DRZL	Freezing Drizzle

Table 8. AFM Sensible Weather Codes.

Probability of Precipitation and Areal Coverage codes appearing in the AFM are shown in Table 9, along with their equivalent POP or areal coverage in percent.

AFM Code	Qualifying Term (Stratiform or Convective)	POP (%)
S	Slight Chance	(> 0 and ≤ 20%)
C	Chance	(30%-50%)
L	Likely	(60%-70%)
O	Occasional/Periods of	(80%-100%)
D	None	(80%-100%)
AFM Code	Areal Term (Convective)	Areal Coverage (%)
IS	Isolated	(≤ 20%)
SC	Scattered	(30%-50%)
NM	Numerous	(60%-70%)
EC	None (extensive coverage)	(80%-100%)
AFM Code	Areal Term (Non-Measurable Stratiform)	Areal Coverage (%)
PA	Patchy	(<25%)
AR	Areas	(25>50%)
WD	Widespread	(>50%)

Table 9. AFM POP and Areal Coverage Codes.

In Figure 19, snapshots of the forecast reveal RAIN is likely (indicated by an “L”) at midnight, 3:00 a.m., and 6:00 a.m. EST WED 02/14/01. This implies that rain is likely during that entire period. Thereafter, the code “C” implies a chance of rain from about 9:00 a.m. until 12 noon on 02/14/01. In contrast, on Monday 2/12/01 no precipitation is forecast, so probability codes are not listed.

Precipitation categories are snapshots available at 3-hour projections out to 60 hours, then averaged over 6-hour intervals out to Day 7.

- n. OBVIS. If an obstruction to visibility (OBVIS) is predicted for the forecast area, a row labeled OBVIS will be listed underneath any forecast of precipitation. If no precipitation is forecast, then OBVIS will be listed under the row labeled CLOUDS. In Figure 19, “K” indicates smoke is forecast to restrict visibility at 6:00 a.m. and 9:00 a.m. EST on Monday 2/12/01. *OBVIS is a snapshot available at 3-hour projections through 60 hours.* The complete AFM OBVIS code list and associated definitions are shown in Table 10.

AFM Code	Obstruction to Visibility
F	Fog
PF	Patchy Fog
F+	Dense Fog
PF+	Patchy Dense Fog
H	Haze
BS	Blowing Snow
K	Smoke
BD	Blowing Dust
VA	Volcanic Ash

Table 10. AFM Obstruction to Visibility Codes.

- o. WIND CHILL and HEAT INDEX. Wind Chill and Heat Index are included seasonally based upon locally defined criteria. The decision on whether to include or exclude these parameters is determined by the local WFO criteria. *WIND CHILL and HEAT INDEX are snapshots at the indicated hour and are forecast at 3-hour projections out to 60 hours.*
- p. MIN CHILL and MAX HEAT. When WIND CHILL or HEAT INDEX values appear in the AFM, a 6-hour minimum wind chill or maximum heat index may appear on the following row. These values indicate the minimum wind chill/maximum heat index forecast to occur during the 6-hour period (inclusive of, and

preceding) the hour indicated at the top of the column. *MIN CHILL and MAX HEAT are included at 6-hr intervals out to 60 hours.*

- q. WATCH, WARNING and ADVISORY. When Valid Time Event Codes (VTEC) as described in NWS Directive 10-1703 become available, long duration hazardous weather events will be included when a valid WATCH, WARNING and/or ADVISORY is issued by a WFO. The weather phenomena codes are decoded into plain language from VTEC and will appear as labels for additional rows at the bottom of the 3HRLY block. Within the text of the AFM, the VTEC codes for WATCH [A], WARNING [W], and ADVISORY [Y] are applied to the 3-hour time spans which most nearly correspond to the actual valid times of the event. That is to say, if the valid time falls within any portion of a particular 3-hour time window, the code will be applied to the entire time span. For example, in Figure 1, the “A” symbol indicates a High Wind Watch is valid for at least a portion of the time between 12:00 noon - 6:00 p.m. EST on February 13. *If forecast, these codes will only appear during the first 60 hours.*

3.3.4.3 Special Instructions for Tropical Cyclones. Due to the uncertainty in the location and intensity of tropical cyclones, special instructions will apply to AFM entries for wind speed, wind direction and wind gusts for various time periods as described in the following sections and Table 11.

- a. Zero to 24 Hours. If forecast winds for a specified land area meet or exceed hurricane force (i.e., 64 kts or 74 mph) within the first 24 hours, the AFM will portray wind direction (WIND DIR) to the 8 points of a compass, deterministic wind speed (WIND SPD), and deterministic wind gusts (WIND GUST) as shown in Table 11.
- b. Beyond 24 Hours. If the potential exists for winds in a specified land area to meet or exceed hurricane force beyond 24 hours, the AFM will portray wind direction, and wind speed using the code “**HU**” in lieu of the deterministic winds (beyond 24 to 60 hours), and in lieu of the predominant wind direction (PWIND DIR) and wind character codes (beyond 60 hours to 120 hours). The code “**HG**” will appear in the AFM to indicate hurricane force wind gusts are possible. HG will be portrayed in lieu of the deterministic wind gusts beyond 24 hours to 60 hours only (see Table 11). Both the HU and HG codes indicate hurricane force winds, or wind gusts respectively, *could* occur. Customers should refer to the tropical cyclone center or local WFO for the latest details concerning the storm.

Forecast Period (Hours)	Wind Direction (8 pts. of Compass)	Sustained Wind Speed (MPH)	Wind Gusts (MPH)
0 to 24	N, NE, E, SE, S, SW, W, or NW	Deterministic (e.g., 74 mph, 95 mph)	Deterministic (e.g., 115 mph)

> 24 to 60	HU (variable and uncertain)	HU (hurricane force possible)	HG (hurricane force possible)
>60 to 120 (Day 5)	HU (variable and uncertain)	HU (hurricane force possible)	N/A

Table 11. AFM entries for Hurricanes.

3.3.5 Format. The AFM is a segmented product automatically generated for individually defined areas in the format shown in Figure 19.

- a. Labels. Alphanumeric parameter labels describing the contents of each row are listed down the left hand edge of the product. Labels are composed of one or more words, but will not extend beyond the 12th character space from the left.
- b. Parameters. All parameters are right justified beneath the valid hour, or the end of the valid period to which they pertain. MAX/MIN is the only exception (see section 3.3.4.2, part a for details). Although right justified, 3 precipitation categories may contain ranges comprising more than 2 or 3 characters. The categories and possible character spaces are as follows:
 - (1) QPF - maximum 9 characters (e.g., 1.00-1.50)
 - (2) MAX QPF - maximum 11 characters (e.g., .75 or 8.00-10.50)
 - (3) SNOW 12HR - maximum 5 characters (e.g., 12-18)
- c. Missing Data. Missing data within an otherwise complete AFM will be indicated by the code, "MM."

1	2	3	4	5	6	7	8
1234567890123456789012345678901234567890123456789012345678901234567890							
Product Format				Description of Entry			
FOaaii cccc ddhhmm				(WMO Heading)			
AFMxxx				(AWIPS ID)			
AREA FORECAST MATRICES				(MND - NWS Product Name)			
NATIONAL WEATHER SERVICE city state				(Issuing Office)			
400 AM EST MON FEB 12 2001				(Issuance Time/Date)			
stZ###-###>###-ddhhmm-				(UGC Type: Zone)-(Exp. Time)			
county st-county st-county st				(Included County or Zone/State)			
400 AM EST MON FEB 12 2001				(Issuance Time/Date)			
DATE MON 02/12/01				TUE 02/13/01			
UTC 3HRLY 08 11 14 17 20 23 02 05 08 11 14 17 20 23 02 05 08 11 14 17 20 23				WED 02/14/01			
EST 3HRLY 03 06 09 12 15 18 21 00 03 06 09 12 15 18 21 00 03 06 09 12 15 18							
MAX/MIN 48 36 38 39 50 53 55 45 49 50 52							
TEMP 33 39 45 46 45 43 41 39 41 45 49 50 49 49 50 48 46 47 47 49 47							
DEWPT 15 17 20 22 25 29 33 34 36 38 40 42 42 43 44 44 44 46 46 43 39							
RH 47 40 36 38 45 57 72 82 82 76 70 73 76 79 79 85 92 96 96 79 73							
WIND DIR NW NW W W SW SW W W S S S S S SW SW S SE SE SE SE							
WIND SPD 5 8 8 8 8 8 5 2 10 14 28 36 26 22 10 8 5 2 2 5 8							
WIND GUST 22 25 42 56 52 34 20							
CLOUDS OV OV OV OV BK BK SC BK BK BK BK OV OV OV OV OV OV BK BK BK							
POP 12HR 10 10 20 70 50							
QPF 12HR 0 0 0 .25-.49 .10-.24							
MAX QPF 0 0 0 .50-.75 .25-.50							
SNOW 12HR 00-00 00-00 00-00							
RAIN S S C L L L C C							
OBVIS K K F F F F F							
WIND CHILL 30 30							
MIN CHILL 24							
HIGH WIND A A							
DATE THU 02/15/01 FRI 02/16/01 SAT 02/17/01 SUN 02/18/01							
UTC 6HRLY 05 11 17 23 05 11 17 23 05 11 17 23 05 11 17 23							
EST 6HRLY 00 06 12 18 00 06 12 18 00 06 12 18 00 06 12 18							
MAX/MIN 35 46 34 41 24 33 18 30							
TEMP 41 39 44 43 40 36 39 34 29 24 29 26 22 19 28 24							
DEWPT 38 36 36 38 37 34 34 32 26 22 21 18 16 16 20 21							
PWIND DIR SE S SW NW N N SE SE							
WIND CHAR LT LT LT LT BZ WY LT LT							
AVG CLOUDS BK BK OV OV BK BK BK SC FW CL CL CL FW SC SC							
POP 12HR 10 40 40 20 0 0 40 60							
RAIN C C C L L							
RAIN SHWRS SC SC SC							
\$\$							

Figure 19. Area Forecast Matrices Product Format - Early Morning Issuance.

3.4 Updates, Amendments and Corrections. The AFM will be updated and corrected when the on-duty forecast team believes the current forecast is not representative, or when format or content errors are detected. When the AFM is updated, all forecast parameters prior to the update time (to the nearest 3-hour period) are removed from the product. Occasionally, a forecast may need a correction. In these instances, the automated AFM product is replaced with the corrected version (See Figure 20).

1	2	3	4	5	6	7	8
1234567890123456789012345678901234567890123456789012345678901234567890							
<u>Product Format</u>				<u>Description of Entry</u>			
FOaaii cccc ddhhmm AAA				(WMO Heading)			
AFMxxx				(AWIPS ID)			
AREA FORECAST MATRICES...UPDATED				(MND - NWS Product Name)			
NATIONAL WEATHER SERVICE city state				(Issuing Office)			
110 PM EST MON FEB 12 2001				(Issuance Time/Date)			
stZ###-###>###-ddhhmm-				(UGC Type: Zone)-(Exp. Time)			
county st-county st-county st				(Included County or Zone/State)			
110 PM EST MON FEB 12 2001				(Issuance Time/Date)			
DATE MON 02/12/01				TUE 02/13/01 WED 02/14/01			
UTC 3HRLY 08 11 14 17 20 23 02 05 08 11 14 17 20 23 02 05 08 11 14 17 20 23							
EST 3HRLY 03 06 09 12 15 18 21 00 03 06 09 12 15 18 21 00 03 06 09 12 15 18							
MAX/MIN 48 36 38 39 50 53 55 45 49 50 52							
TEMP 46 45 43 41 39 41 45 49 50 49 49 50 48 46 47 47 49 47							
DEWPT 22 25 29 33 34 36 38 40 42 42 43 44 44 44 46 46 43 39							
RH 38 45 57 72 82 82 76 70 73 76 79 79 85 92 96 96 79 73							
WIND DIR W SW SW W W S S S S S S SW SW S SE SE SE SE							
WIND SPD 8 8 8 5 2 10 14 28 36 26 22 10 8 5 2 2 5 8							
WIND GUST 22 25 42 56 52 34 20							
AVG CLOUDS OV BK BK SC BK BK BK BK BK OV OV OV OV OV OV OV BK BK BK							
POP 12HR 10 10 20 70 50							
QPF 12HR 0 0 0 .25-.49 .10-.24							
MAX QPF 0 0 0 .25-.49 .10-.24							
SNOW 12HR 00-00 00-00 00-00							
RAIN S S C L L L C C							
OBVIS F F F F F							
WIND CHILL							
MIN CHILL							
HIGH WIND A A							
etc...							

Figure 20. Area Forecast Matrices Update Format.

4. Point Forecast Matrices (product category PFM).

4.1 Mission Connection. The Point Forecast Matrices (PFM) product displays various forecasted weather parameters for verification points, significant cities, and any other pre-defined points within a WFO's geographic area of responsibility. Forecasts for these parameters are at 3-hour, 6-hour, and/or 12-hour intervals. The PFM is intended for use by large volume users of NWS forecast information and for use by the general public. The quasi-static matrix format of the PFM allows for rapid visual scanning of a large number of forecast parameters/values. In addition, the forecast data is decodable by computers for those who wish to create derived products. Information in the PFM is provided to customers and partners as supplemental detail and/or higher resolution detail than can be found in other standard NWS products. Through the PFM product, the NWS strives to improve communications to the public and hazards community, increase forecast resolution, provide customers the information on which they can base their decisions, and increase forecast and warning accessibility by all customers.

4.2 Issuance Guidelines.

4.2.1 Creation Software. This product is created using the Advanced Weather Interactive Processing System (AWIPS) Interactive Forecast Preparation System (IFPS) software.

4.2.2 Issuance Criteria. The PFM is a dynamic product issued by all WFOs for each of their verification points, significant cities and other locally defined locations within their geographic area of responsibility. The PFM should be issued whenever necessary to always depict the latest expected weather conditions at the specified point through Day 7.

4.2.3 Issuance Time. The PFM is an event-driven product and may be issued at any time. However, at a minimum the PFM will be issued twice daily to remove the outdated first period of the forecast. These mandatory issuance times will occur no later than 4:00 a.m. and 4:00 p.m. local time.

4.2.4 Valid Time. The PFM is valid from the time of release through Day 7.

4.2.5 Product Expiration Time. The PFM product expiration time is 15 hours from the initial time of issuance.

4.3 Technical Description. PFMs should follow the format and content described in the following section.

4.3.1 UGC Type. The PFM product will use the (Z) form of the UGC to identify the zone in which the specified point resides. A latitude/longitude line is included in the product to identify the specified point location.

4.3.2 MND Broadcast Instruction Line. PFMs do not contain an MND Broadcast Instruction Line.

4.3.3 MND Product Type Line. The Point Forecast Matrices MND line is, "POINT FORECAST MATRICES."

4.3.4 Content. The following section describes the detailed content of the PFM product.

4.3.4.1 Date/Time Block. Below the product issuance time/date (headline, if present) , the forecast date and time blocks will be displayed. The day of the week will be expressed by the standard 3-letter identifiers (SUN, MON, TUE, WED, THU, FRI, SAT) followed by the month, day and year (MM/DD/YY). The day and date labels are left justified above the 6:00 a.m. local time hour.

The following two lines provide the forecast times at 3 hour intervals (indicated by 3HRLY) out to 60 hours (2 ½ days) into the future. Listed on the far left of the time lines, the 3-letter codes (e.g. UTC, EST etc.) identify the time expression. The Universal Time Coordinate (UTC) will always be listed on the first line, followed by the local time for the area covered by the PFM. In

this example, the “EST 3HRLY” indicates the time zone is Eastern Standard Time (EST), and the minimum forecast interval for any parameter is 3 hours.

The second block is valid from 66 hours through Day 7. Once again, the local time zone is EST, but the time interval is no longer 3 hours. Forecast parameters are valid for time intervals of at least 6 hours (indicated by 6HRLY), otherwise for 12 hours (see Figures 21 and 22).

DATE	MON 02/12/01					TUE 02/13/01					WED 02/14/01				
UTC 3HRLY	08	11	14	17	20	23	02	05	08	11	14	17	20	23	
EST 3HRLY	03	06	09	12	15	18	21	00	03	06	09	12	15	18	
DATE	THU 02/15/01					FRI 02/16/01					SAT 02/17/01				
UTC 6HRLY	05	11	17	23	05	11	17	23	05	11	17	23	05	11	17
EST 6HRLY	00	06	12	18	00	06	12	18	00	06	12	18	00	06	12

Figure 21. PFM Date/Time Block.

4.3.4.2 Forecast Parameters. The following PFM forecast parameters are listed in order of their appearance within the product. All elements are mandatory for a defined time period unless otherwise noted. However, precipitation type parameters are independent and will only appear in either the 3HRLY or 6HRLY blocks when forecast. Other elements such as wind chill and heat index are seasonal as defined by the local office. Watch, Warning, and Advisory information will also appear only when forecast.

- a. **MAX/MIN.** *(Alternatively labeled as MIN/MAX for afternoon issuance)*
A forecast of maximum or minimum temperatures in degrees Fahrenheit (F). The MAX temperature is valid for the period 7:00 a.m. through 7:00 p.m. local standard time, and “MIN” is valid for 7:00 p.m. through 8:00 a.m. local standard time (note that due to a 3-hour minimum time resolution, this element is right justified in the column beneath the *approximate* ending time of the MAX/MIN period). The nighttime MIN and daytime MAX are displayed as a single integer comprising 3 character spaces or less (e.g., -2, 8, 53, 102). For example, in Figure 22 the MIN temperature forecast for Tuesday night 2/13/01 is 45 degrees Fahrenheit. *MAX/MIN is forecast out through Day 7.*
- b. **TEMP.** TEMP is a snapshot of the expected temperature in degrees F valid at the specified point at the indicated hour. The temperature is right justified in the column below the hour to which it refers. For example, in Figure 22 the forecasted temperature for 6:00 a.m. EST Wednesday 02/14/01 is 46 degrees F. *TEMP is available at 3-hour projections through 60 hours, then 6-hour projections through Day 7.*
- c. **DEWPT.** DEWPT is a snapshot of the expected dew point temperature in degrees F for the same time periods as its corresponding temperature forecast. DEWPT is located directly below the temperature line.
- d. **RH.** The relative humidity (RH) is a snapshot of the expected RH for the same time periods as its corresponding temperature and dew point forecast. The RH

row is located directly below the “DEWPT” row. For example, in Figure 22 the RH at 3:00 p.m. (1500 hours) on 02/12/01 is based on a temperature of 46 degrees F and a dew point of 22 degrees F. The RH is 38%. *RH is available at 3-hour projections through 60 hours.*

- e. **WIND DIR.** WIND DIR is a snapshot of the expected wind direction forecast to occur at the indicated hour, using the 8 points of a compass (i.e., N, NE, E, SE, S, SW, W, NW). For example, in Figure 22 the forecasted prevailing wind direction, i.e., the direction from which the wind is blowing, at 9:00 a.m. EST Monday 02/12/01 is Northwest (NW). If a calm wind is forecast, double zeros (00) will be listed in place of a wind direction. WIND DIR is located below the hour to which it refers. *WIND DIR is available at 3-hour projections out to 60 hours.* (Note special exception to wind direction for hurricanes in section 4.3.4.3.)

In the 6HRLY block, **PWIND DIR** is the “predominant” wind direction at the point during the 12-hour period between 6:00 a.m. and 6:00 p.m., or 6:00 p.m. and 6:00 a.m. local time. *PWIND DIR is available beyond 60 hours through Day 7.*

- f. **WIND SPD.** WIND SPD is a snapshot of the sustained wind speed in miles per hour (MPH) forecast to occur at the indicated hour through 60 hours. For example, in Figure 22 the forecasted wind speed at 3:00 p.m. (1500 hours) EST Tuesday 02/13/01 is 36 MPH. If a calm wind is forecast, double zeros (00) will be listed in place of a wind speed. (Note special exception to wind speed for hurricanes in section 4.3.4.3.) *WIND SPD is available at 3-hour projections out to 60 hours.*

WIND CHAR codes are used beyond 60 hours through Day 7 of the forecast and denote the character of the wind for the specified point during the 12-hour period between 6:00 a.m. and 6:00 p.m., or 6:00 p.m. and 6:00 a.m. local time. WIND CHAR is comprised of range categories used in conjunction with deterministic wind speeds. Each range category is equated to a descriptive wind term, i.e., a “wind character” to best describe the MAXIMUM SUSTAINED wind speed during the period. For example, in Figure 22, on Saturday 02/17/01 during the 12-hour period between 6:00 a.m. and 6:00 p.m., the PFM code “WY” indicates that the period is expected to be “WINDY” with maximum (sustained) speeds in the range of 23 to 30 mph. See Table 12 for the complete list of PFM wind categories.

Wind Character Codes	Wind Character	12-hr Maximum Sustained Wind Speed
LT	Light	< 8 mph
GN	Gentle	8 - 14 mph

BZ	Breezy	15 - 22 mph
WY	Windy	23 - 30 mph
VW	Very Windy	31 - 39 mph
SD	Strong/Damaging	≥ 40 mph

Table 12. PFM Wind Character Codes.

- g. WIND GUST. A wind gust row will appear in the 3HRLY block whenever forecasted wind gusts exceed the sustained wind speed (WIND SPD) by at least 10 MPH. WIND GUST is a snapshot valid on the hour indicated at the top of the corresponding column. For example, in Figure 22, the maximum wind gust at 6:00 p.m. (1800 hours) EST Tuesday 02/13/01 is forecast to be 52 MPH. *WIND GUST is a snapshot of gusts of wind occurring at the indicated hour and is available at 3-hour projections through 60 hours.* (Note special exception to wind gust in reference to hurricanes in section 4.3.4.3.)
- h. CLOUDS. The CLOUDS category provides a snapshot of sky coverage during the indicated hour. CLOUDS is divided into five category codes ranging from clear to overcast. Each code represents an equivalent percentage of opaque sky cover in percent. *CLOUDS parameter is included at 3-hour projections out to 60 hours.* In the 6HOURLY section, AVG CLOUDS is valid for 6-hour intervals beyond 60 hours through Day 7 and indicates the average amount of all clouds during the 6-hour period ending on the hour indicated at the top of the column. The complete cloud codes and equivalent sky cover definitions are shown in Table 13.

PFM Sky Cover Code	Sky Cover Expression	Equivalent Percent Opaque Sky Cover
CL	Clear/Sunny	0% to ≤ 6%
FW	Mostly Clear/Mostly Sunny	> 6% and ≤ 31%
SC	Partly Cloudy/Partly Sunny	>31% and ≤ 69%
BK	Mostly Cloudy	>69% and ≤ 94%
OV	Cloudy	>94% and ≤ 100%

Table 13. PFM Sky Cover Codes.

- i. POP 12HR. Probability of Precipitation (POP), is defined as the likelihood, expressed as a percent, of a measurable precipitation event (1/100th of an inch) at the specific PFM point. The “12HR” refers to the 12-hour valid time ending at 6:00 a.m. or 6:00 p.m. local time (0600 or 1800). The POP 12HR values that

may appear in the PFM are as follows: 0, 5, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100. These values are right justified in the column beneath the hour defining the ending time of the valid period. In Figure 22, there is a 70% chance of precipitation during the 12-hour period between 6:00 p.m. EST Tuesday 02/13/01 and 6:00 a.m. EST 2/14/01. *POP 12HR is forecast through Day 7.*

- j. QPF 12HR. This parameter, quantitative precipitation forecast (QPF) represents the total amount of liquid precipitation, in inches, expected at the specific point during a 12-hour period ending at 6:00 a.m., or 6:00 p.m. local time. The QPF is presented in locally defined ranges, (e.g., .10-.24), or single values. The QPF 12HR value is right justified in the column beneath the hour defining the ending time of the expected precipitation. For example, in Figure 22, the QPF 12HR indicates that a total of .25-.49 inches of precipitation is expected sometime during the period beginning at 6:00 p.m. EST Tuesday 2/13/01 and ending by 6:00 a.m. EST Wednesday 2/14/01. *QPF 12HR is forecast out to 60 hours.*
- k. SNOW 12HR. The expected range of total snowfall accumulation (in whole inches) forecast to occur at the specific point during a 12-hour period ending at 6:00 a.m. or 6:00 p.m. local time. SNOW 12HR will only appear during the locally defined winter period. The snow parameter contains 1 to 5 alphanumeric characters which are right justified in the column below the hour defining the *ending time* of the precipitation period. SNOW 12HR may appear as a one or two digit number (1, 4, 12), or as a specified range (2-4, 8-12). When no snowfall is forecast during the locally specified winter period, double zeros (00-00) will appear in the row. Snowfall that is not measurable (less than 0.1 inch of frozen precipitation) is referred to as a trace. A trace of snow is depicted by a "T." *SNOW 12HR is forecast out to 36 hours.*
- l. PRECIPITATION TYPE AND CATEGORY. The PFM may list several types of precipitation. Precipitation types only appear in the PFM if they are forecast to occur *at the specified point during the seven day forecast*. Precipitation type codes are listed in the far left column of the PFM. For each type of precipitation that is forecast, an associated POP category is specified within the body of the product. Beyond 60 hours through Day 7, the POP category reflects the prevailing POP during the 6-hour period including and preceding the hour indicated at the top of the column. PTYPE and Category is available at *3-hr projections out to 60 hours, then for 6-hour periods beyond 60 hours through Day 7*. The types of precipitation that may be forecast in the PFM are shown in Table 14.

PFM Code	Sensible Weather
RAIN	Rain
RAIN SHWRS	Rain Showers

SPRINKLES	Sprinkles
TSTMS	Thunderstorms
DRIZZLE	Drizzle
SNOW	Snow
SNOWSHWRS	Snow Showers
FLURRIES	Snow Flurries
SLEET	Ice Pellets
FRZG RAIN	Freezing Rain
FRZG DRZL	Freezing Drizzle

Table 14. PFM Sensible Weather Codes.

Probability of precipitation codes and their equivalent POP definitions are shown in Table 15 below.

PFM Code	Qualifying Term (Stratiform or Convective)	POP (%)
S	Slight Chance	(> 0 and ≤ 20%)
C	Chance	(30%-50%)
L	Likely	(60%-70%)
O	Occasional/Periods of	(80%-100%)
D	None	(80%-100%)

Table 15. PFM Probability of Precipitation Codes.

In Figure 22, snapshots of the forecast reveal RAIN is likely (indicated by an “L”) at midnight, 3:00 a.m., and 6:00 a.m. EST WED 02/14/01. This implies that rain is likely during that entire period. Thereafter, the code “C” implies a chance of rain from about 9:00 a.m. until 12 noon on 02/14/01. In contrast, on Monday 2/12/01 no precipitation is forecast, so probability codes are not listed.

Precipitation categories are snapshots available at 3-hour projections out to 60 hours, then averaged over 6-hour intervals out to Day 7.

- m. OBVIS. If an obstruction to visibility (OBVIS) is forecast at the specific point, a row labeled OBVIS will be listed underneath any forecast of precipitation. If no precipitation is forecast, then OBVIS will be listed under the row labeled

CLOUDS. In Figure 22, “K” indicates smoke is forecast to restrict visibility at 6:00 a.m. and 9:00 a.m. EST on Monday 2/12/01. *OBVIS is a snapshot available at 3-hour projections through 60 hours.* The complete PFM OBVIS code list and associated definitions are shown in Table 16.

PFM Code	Obstruction to Visibility
F	Fog
PF	Patchy Fog
F+	Dense Fog
PF+	Patchy Dense Fog
H	Haze
BS	Blowing Snow
K	Smoke
BD	Blowing Dust
VA	Volcanic Ash

Table 16. PFM Obstruction to Visibility Codes.

- n. WIND CHILL and HEAT INDEX. Wind Chill and Heat Index are included seasonally based upon locally defined criteria. The decision on whether to include or exclude these parameters is determined by the local WFO criteria. *WIND CHILL and HEAT INDEX are snapshots at the indicated hour and are forecast at 3-hour intervals out to 60 hours.*
- o. MIN CHILL and MAX HEAT. When WIND CHILL or HEAT INDEX values appear in the PFM, a 6-hour minimum wind chill or maximum heat index may appear on the following row. These values indicate the minimum wind chill/maximum heat index forecast to occur during the 6-hour period (inclusive of, and preceding) the hour indicated at the top of the column. *MIN CHILL and MAX HEAT are included at 6-hr intervals out to 60 hours.*
- p. WATCH, WARNING and ADVISORY. When Valid Time Event Codes (VTEC) as described in NWS Directive 10-1703 become available, long duration hazardous weather events will be included when a valid WATCH, WARNING and/or ADVISORY is issued by a WFO. The weather phenomena codes are decoded into plain language from VTEC and will appear as labels for additional rows at the bottom of the 3HRLY block. Within the text of the PFM, the VTEC codes for WATCH [A], WARNING [W], and ADVISORY [Y] are applied to the 3-hour time spans which most nearly correspond to the actual valid times of the event. That is to say, if the valid time falls within any portion of a particular 3-

hour time window, the code will be applied to the entire time span. For example, in Figure 1, the “A” symbol indicates a High Wind Watch is valid for at least a portion of the time between 12:00 noon - 6:00 p.m. EST on February 13. *If forecast, these codes will only appear during the first 60 hours.*

4.3.4.3 Special Instructions for Hurricanes. Due to the uncertainty in the location and intensity of tropical cyclones, special instructions will apply to PFM entries for wind speed, wind direction and wind gusts for various time periods. Refer to AFM section 3.3.4.3 and Table 11 for details.

4.3.5 Format. The PFM is a segmented product automatically generated for individual point locations in the format shown in Figure 22.

- a. Labels. Alphanumeric parameter labels describing the contents of each row are listed down the left hand edge of the product. Labels are composed of one or more words, but will not extend beyond the 12th character space from the left.
- b. Parameters. All parameters are right justified beneath the valid hour, or the end of the valid period to which they pertain. MAX/MIN is the only exception (see section 4.3.4.2, part a for details). Although right justified, 2 precipitation categories may contain ranges comprising more than 2 or 3 characters. The categories and possible character spaces are as follows:
 - (1) QPF - maximum 9 characters (e.g., 1.00-1.50)
 - (2) SNOW 12HR- maximum 5 characters (e.g., 12-18)
- c. Missing Data. Missing data within an otherwise complete PFM will be indicated by the code, “MM.”

1	2	3	4	5	6	7	8																					
1234567890123456789012345678901234567890123456789012345678901234567890																												
Product Format				Description of Entry																								
FOaaii cccc ddhhmm				(WMO Heading)																								
PFMxxx				(AWIPS ID)																								
POINT FORECAST MATRICES				(MND - NWS Product Name)																								
NATIONAL WEATHER SERVICE city state				(Issuing Office)																								
400 AM EST MON FEB 12 2001				(Issuance Time/Date)																								
stZ###-ddhhmm-				(UGC Type: Zone)-(Exp. Time)																								
point location-county st				(Plain language Location-County St)																								
11.11d 111.11d				(Point latitude & longitude)																								
400 AM EST MON FEB 12 2001				(Issuance Time/Date)																								
DATE	MON 02/12/01							TUE 02/13/01							WED 02/14/01													
UTC 3HRLY	08	11	14	17	20	23	02	05	08	11	14	17	20	23	02	05	08	11	14	17	20	23						
EST 3HRLY	03	06	09	12	15	18	21	00	03	06	09	12	15	18	21	00	03	06	09	12	15	18						
MAX/MIN	47							38	52							45	52											
TEMP	33	39	45	46	45	43	41	39	41	45	49	50	49	49	50	48	46	47	47	49	47							
DEWPT	15	17	20	22	25	29	33	34	36	38	40	42	42	43	44	44	44	46	46	43	39							
RH	47	40	36	38	45	57	72	82	82	76	70	73	76	79	79	85	92	96	96	79	73							
WIND DIR	NW	NW	W	W	SW	SW	W	W	S	S	S	S	S	S	SW	SW	S	SE	SE	SE	SE							
WIND SPD	5	8	8	8	8	8	5	2	10	14	28	36	26	22	10	8	5	2	2	5	8							
WIND GUST								22	25	42	56	52	34	20														
CLOUDS	OV	OV	OV	OV	BK	BK	SC	BK	BK	BK	BK	BK	OV	OV	OV	OV	OV	OV	BK	BK	BK							
POP 12HR	5							10	20							70	50											
QPF 12HR	0							0	0							.25-.49	.10-.24											
SNOW 12HR	00-00							00-00	00-00																			
RAIN									S S C							L L L	C C											
OBVIS	K K							F F F F F																				
WIND CHILL	30	30																										
MIN CHILL	24																											
HIGH WIND								A A																				
DATE	THU 02/15/01							FRI 02/16/01							SAT 02/17/01							SUN 02/18/01						
UTC 6HRLY	05	11	17	23	05	11 17 23 05							11 17 23 05							11 17 23								
EST 6HRLY	00	06	12	18	00	06 12 18 00							06 12 18 00							06 12 18								
MAX/MIN	35		46		34		41		24		33		18		30													
TEMP	41	39	44	43	40	36	39	34	29	24	29	26	22	19	28	24												
DEWPT	38	36	36	38	37	34	34	32	26	22	21	18	16	16	20	21												
PWIND DIR	SE		S		SW		NW		N		N		SE		SE													
WIND CHAR	LT		LT		LT		LT		BZ		WY		LT		LT													
AVG CLOUDS	BK		BK		OV		OV		BK		BK		SC		FW		CL		CL		CL		FW		SC		SC	
POP 12HR	10		40		40		20		0		0		40		60													
RAIN								C C												C L L								
RAIN SHWRS								C C S																				
\$\$																												

Figure 22. Point Forecast Matrices - Early Morning Issuance.

4.4 Updates, Amendments and Corrections. The PFM will be updated and corrected when the on-duty forecast team believes the current forecast is not representative, or when format or content errors are detected. When the PFM is updated, all forecast parameters prior to the update time (to the nearest 3-hour period) are removed from the product. Occasionally, a forecast may need a correction. In these instances, the automated PFM product is replaced with the corrected version.

5. **Area Forecast Discussion (product category AFD).**

5.1 **Mission Connection.** The Area Forecast Discussion (AFD) is a semi-technical product primarily used as a means to explain the scientific rationale behind a forecast and summarize watches, warnings and/or advisories in effect. This highly visible product is used to convey forecast and watch/warning/advisory information primarily to federal agencies, weather sensitive officials, and the media. The AFD is also useful for coordination among WFOs and River Forecast Centers, National Centers, and CWSUs. The forecast insight provided in the AFD is beyond that which can be found in other NWS products.

5.2 **Issuance Guidelines.**

5.2.1 **Creation Software.** The AFD should be composed using the IFPS preformatted AFD shell, or other text editor.

5.2.2 **Issuance Criteria.** The AFD is issued at least twice a day by all WFOs in accordance with the mandatory ZFP issuances. AFDs should be issued more frequently to provide reasoning for forecast updates or to provide an explanation of rapidly-evolving mesoscale trends.

5.2.3 **Issuance Time.** WFOs should issue AFDs within the 2-hour period preceding or 1-hour period following the release of the ZFP. AFDs should be issued within 1-hour prior to, or after updated forecast packages.

5.2.4 **Valid Time.** AFDs are valid from time of release until the next complete update.

5.2.5 **Product Expiration Time.** AFDs do not contain a product expiration time.

5.3 **Technical Description.** AFDs should follow the format and content described in the following section.

5.3.1 **Universal Geographic Code (UGC) Type.** There is no UGC coding associated with the AFD product.

5.3.2 **MND Broadcast Instruction Line.** There is no MND Broadcast Instruction Line associated with this product.

5.3.3 **MND Product Type Line.** All CONUS WFOs will use the AFD MND header , “AREA FORECAST DISCUSSION.” Alaska Region will use, “[NORTHERN or SOUTHEAST] ALASKA FORECAST DISCUSSION.” Hawaii will use, “HAWAIIAN ISLANDS FORECAST DISCUSSION.” Puerto Rico will use, “PUERTO RICO AND U.S. VIRGIN ISLANDS FORECAST DISCUSSION.” GUAM will use, “MICRONESIA AND THE MARIANAS FORECAST DISCUSSION.”

5.3.4 **Content.** The AFD consists of two primary sections: (1) a narrative description of forecast information and reasoning, and (2) a summary of public, marine and fire weather outlook/watch/ warning/advisory issuances. The discussions should focus on the most

significant weather issues to affect a WFO's geographic area of responsibility during the seven day forecast period. Emphasis should be placed on those forecast periods where outlooks/watches/warnings/ advisories are in effect, proposed, or are being considered. The narrative content of this product should be professional and remain focused on the meteorology. Editorial comments are inappropriate.

- a. Narrative Discussion. The narrative discussion is a concise explanation of forecast reasoning and should express the deliberations made by the WFO forecast team, as well as consensus decisions with adjacent offices, RFCs, and National Centers. Use of data sources, such as the WSR-88D, ASOS, Profiler, satellite, local and national models, and local and national analysis are encouraged. The discussion should emphasize significant aspects of the forecast such as:
 - (1) identification of the most significant hydrometeorological weather to affect the geographical area of responsibility during the 7 Day forecast period;
 - (2) identification of the forecast problem(s)-of-the-day and explanation of their solution (s);
 - (3) an indication of forecast team confidence and probabilistic guidance on weather possibilities not found in other products;
 - (4) reasoning behind watch/warning/advisory issuance;
 - (5) differences in model guidance and an indication as to which model appears the most correct and why;
 - (6) reasoning for varying significantly from automated model output guidance products;
 - (7) reasons for significant changes from the previous forecast;
 - (8) expected timing of events such as beginning or ending of precipitation and degree of uncertainty; and
 - (9) a brief review of the synoptic situation.
- b. Watch/Warning/Advisory Block. The Watch/Warning/Advisory Block (see Appendix A, section 2 for an example) is used to summarize public, fire weather and marine long duration hazardous weather contained in the associated forecast package. Include the watch/warning/advisory block in all AFDs in a separate section after the narrative discussion.

- (1) Hurricanes and Tropical Storms. WFOs will also include watches and warnings for hurricanes and tropical storms affecting their geographic area of responsibility.
- (2) Exclusions. Do not list short duration warnings (of a few hours or less) for convective events, and flash floods; severe thunderstorm and tornado watches; or flood warnings.

No formal coding schemes for the watch/warning/advisory block are required. The areas affected may be described geographically and/or by forecast zones. Well known contractions are permitted in this section. If zones are not referenced, the geographical description should be detailed enough to allow for an accurate interpretation of the referenced area. For example, instead of just "NRN," add a fraction or delineate with reference to station identifiers and/or prominent topographic features (such as "NRN QTR" or "NRN MO N OF MO RVR"). If topographic features are used without zone references, their approximate location within the state should be given. An example without zones would be "MT SHASTA SISKIYOU AREA OF XTRM NRN CA." Use the Geographical Area Designator Map in Appendix E for guidance in determining geographical names for locations throughout the continental United States.

When no public and marine watch/warning/advisory information is needed, use the word "NONE."

- c. Preliminary Point Temperatures and POPs. At regional discretion, the forecaster may include preliminary point forecasts of temperatures and/or probability of precipitation for key locations following the narrative (See section 5.3.5 b for specific format).
- d. Use of Contractions. AFDs should be composed in plain language using complete words. Limited use of contractions is permitted (e.g., to avoid repetition of lengthy terms, or to allow forecasters to save time by expressing their thoughts more concisely) under the following two circumstances:
 - (1) All contractions will be the official NWS terms as found in the United States Aeronautical Contractions Handbook 7340.1[x], where "x" is the most recent version (see Appendix D).
 - and,
 - (2) Contractions must be well-known by the user community (e.g., PAC NW for Pacific Northwest, TSTM for thunderstorm etc.) .

5.3.5 Format. The AFD is divided into at least two distinct sections, the narrative and the watch/warning /advisory block. In addition, various other introductory section identifiers (as shown in format) may be used to organize, clarify, and allow for automatic retrieval of

information from the product. When these optional section identifiers are used, they must be entered exactly as shown below --using the same spelling, preceded by a period (.) and followed by three periods (...). The information that follows may either be on the same line or on the next line (see Figure 23).

- a. Narrative. The narrative is primarily a free form text section. However, topic dividers are used to highlight the text which follows, and allows for automatic retrieval of program specific information. If used, there will be no deviation from exact spelling and format. Each topic will be followed by a double ampersand "&&" and a line feed to indicate the end of the section.

To introduce the narrative section(s), either use topic divider (1), or topic dividers (2) below (see Figure 23 for product format).

- (1) .DISCUSSION...
or
- (2) .SHORT TERM... and .LONG TERM... (in conjunction)

The following topic dividers are optional, and should be included as appropriate. Topic dividers should be logically ordered based on the significance of the information. The ".PREV DISCUSSION..." should be inserted as the final topic divider unless preliminary point temps/pops are generated by a WFO. In these cases, ".PRELIMINARY POINT TEMPS/POPS..." is the final topic divider.

- ◆ .SYNOPSIS...*[insert brief wx depiction & movement of systems]*
- ◆ .MARINE...*[insert marine weather /sea state information]*
- ◆ .AVIATION...*[insert aviation weather information]*
- ◆ .FIRE WEATHER...*[insert fire weather information]*
- ◆ .HYDROLOGY...*[insert hydrologic information, e.g., QPF, rivers]*
- ◆ .CLIMATE...*[insert climatological information]*
- ◆ .UPDATE...*[insert reasoning for forecast update]*
- ◆ .PREV DISCUSSION...*[append previous AFDs (or significant portions thereof) within the last 24 hours. Include the issuance time of the AFD. Do not include the Watch/Warning/ Advisory Blocks from the previous AFDs]*
- ◆ .PRELIMINARY POINT TEMPS/POPS...*[insert temp/pop data - use plain language site names for easy identification]*

- b. Watch/Warning/Advisory Block. Information will be introduced in the format:

" .XXX WATCHES/WARNINGS/ADVISORIES . . ." beginning at the left margin and one blank line below the last line of the text, where XXX

is the modernized three letter identifier of the issuing office. If a WFO's County Warning Area (CWA) falls entirely within one state, the use of state identifications are not necessary. If a WFO's CWA covers multiple states, begin a new line with the two-letter state identification followed by three dots (...) and the list of watches, warnings and advisories applicable to that state. (see Figure 23 for format example).

FXaaii cccc ddhhmm AFDxxx	<i>WMO heading</i> <i>AWIPS ID</i>
<u>Product Format</u>	<u>Description of Entry</u>
AREA FORECAST DISCUSSION (see section 5.3.3 for exceptions) NATIONAL WEATHER SERVICE city state time am/pm time_zone day mon dd yyyy ...[headline to highlight any topical forecast information]... .DISCUSSION... <i>or</i> .SHORT TERM... .LONG TERM... [insert narrative text] && .SYNOPSIS... (Optional) && .MARINE... (Optional) && .AVIATION... (Optional) && .FIRE WEATHER... (Optional) && .HYDROLOGY... (Optional) && .CLIMATE... (Optional) && .UPDATE... (Optional) && .PREV DISCUSSION... (Optional) && .PRELIMINARY POINT TEMPS/POPS... (Optional) site name tt tt tt tt / pp pp pp pp site name tt tt tt tt / pp pp pp pp etc... && .XXX WATCHES/WARNINGS/ADVISORIES...(<i>where XXX= issuing office 3-letter identifier</i>). ST...[When a CWFA covers multiple states, insert watch, warning, advisory and location or NONE. Follow by a period (.)] ST... etc... && \$\$ Name/Initials/Foreccaster ID(s) (Optional)	(<i>MND/NWS Product Name</i>) (<i>Issuing Office or Agency</i>) (<i>Issuing Time/Date</i>) (<i>Topical Headline - Optional</i>)

Figure 23. Area Forecast Discussion Product Format.

5.4 Updates, Amendments and Corrections. AFDs should be updated between regular issuances to explain major changes to the forecast, to provide a technical explanation of mesoscale trends, or supply information which may be of particular interest to customers. A previous AFD may be appended to the update to provide background information and a more thorough discussion of the entire forecast. WFOs will correct AFDs for format and grammatical errors as required.

6. State Forecast Product (product category SFP).

6.1 Mission Connection. The SFP is a general 5 day public forecast of hydrometeorological conditions across the state (or part of the state) in which a WFO resides. The forecast area typically includes an entire state or part of one or more states. The SFP uses the discrete period format and is utilized by a wide variety of customers and partners such as the media, emergency managers, and the general public.

6.2 Issuance Guidelines.

6.2.1 Creation Software. The designated WFO should use the AWIPS text editor or other text editors to generate the SFP.

6.2.2 Issuance Criteria. The SFP is a routine product issued twice daily by WFOs* in lieu of, or in addition to the Tabular State Forecast Product (SFT). *Alaska Region and Guam are not required to issue the narrative SFP and are exempt from this issuance criteria.

6.2.3 Issuance Time. The SFP should be issued within 1-hour following the mandatory ZFP releases (which occur no later than 4:00 a.m. and 4:00 p.m. local time).

6.2.4 Valid Time. The SFP is valid from the time of release through Day 5.

6.2.5 Product Expiration Time. The expiration time is 15 hours from the initial time of issuance.

6.3 Technical Description. The SFP is defined by the format and content described in this section.

6.3.1 UGC Type. The State Forecast Product will use the (Z) form of the UGC.

6.3.2 MND Broadcast Instruction Line. Not applicable.

6.3.3 MND Product Type Line. The MND line is "STATE FORECAST FOR [state or part of state]."

6.3.4 Format. The SFP should be in the discrete period format and use appropriate UGC containing public zones. For the morning issuance, the periods begin with ".TODAY...". The morning issuance contains three 12-hour periods followed by three 24-hour periods. The

evening issuance periods begin with ".TONIGHT...". Evening forecasts contain four 12-hour periods followed by three 24-hour periods.

There are two available formats for the SFP: a product with only one geographic forecast segment, and a product containing two or more geographic forecast segments. At regional discretion, offices may use either format to provide the clearest and most understandable depiction of the forecast conditions.

6.3.4.1 Combining Periods. The first period of the SFP must stand alone. All other forecast periods may be combined when weather elements are similar (as regionally defined).

6.3.4.2 One Geographic Forecast Segment. For SFPs that contain only one geographic forecast segment, the UGC will be on the line immediately after the AWIPS ID (SFPxxx) line. See Figure 24 for a format description.

6.3.4.3 Multiple Geographic Forecast Segments. For regionally approved SFPs that contain two or more geographic forecast segments, the UGC and a suitable geographic name will appear immediately before each separate geographic forecast segment followed by a double dollar (\$\$) delimiter after each segment. The UGC uses the appropriate public zones to differentiate areas. See Figure 25 for a format description.

```

FPaaii cccc ddhhmm
SFPxxx
stZNNN-NNN>NNN-stZNNN-ddhhmm-

STATE FORECAST FOR [state/area]
NATIONAL WEATHER SERVICE [forecast office, state]
time am/pm time_zone day mon dd yyyy

...HEADLINE(s)... (as appropriate)

.TODAY... (6am-6pm) (Max temp)
.TONIGHT... (6pm-6am) (Min temp)
.DAY 2... (6am-6pm) (Max temp)
.DAY 3... (6am-6am) (Min/Max temp)
.DAY 4... (6am-6am) (Min/Max temp)
.DAY 5... (6am-6am) (Min/Max temp)

$$

Fcstr Name/Initials/ID (optional)

```

Figure 24. One Geographic Forecast Segment. This example uses a morning issuance.

```

FPaaai cccc ddhhmm
SFPxxx

STATE FORECAST FOR [state/area]
NATIONAL WEATHER SERVICE [forecast office, state (optional)]
time pm time_zone day mon dd yyyy

stZNNN-NNN>NNN-stZNNN-ddhhmm-
[part of state/area]-
[NATIONAL WEATHER SERVICE forecast office, state] (optional as necessary)
time pm time_zone day mon dd yyyy

...HEADLINE(s)... (as appropriate)

.TONIGHT... (6pm-6am) (Min temp)
.TOMORROW... (6am-6pm) (Max temp)
.TOMORROW NIGHT... (6pm-6am) (Min temp)
.DAY 2... (6am-6pm) (Max temp)
.DAY 3... (6am-6am) (Min/Max temp)
.DAY 4... (6am-6am) (Min/Max temp)
.DAY 5... (6am-6am) (Min/Max temp)

$$ (UGC delimiter)

stZNNN-NNN>NNN-stZNNN-ddhhmm-
[part of state/area]-
[NATIONAL WEATHER SERVICE forecast office, state] (optional as necessary)
time pm time_zone day mon dd yyyy

...HEADLINE(s)... (as appropriate)

.TONIGHT... (6pm-6am) (Min temp)
.TOMORROW... (6am-6pm) (Max temp)
.TOMORROW NIGHT... (6pm-6am) (Min temp)
.DAY 2... (6am-6pm) (Max temp)
.DAY 3... (6am-6am) (Min/Max temp)
.DAY 4... (6am-6am) (Min/Max temp)
.DAY 5... (6am-6am) (Min/Max temp)

$$ (UGC delimiter)

etc...

```

Figure 25. Multiple Geographic Forecast Segments from one or more WFOs. This example uses an evening issuance.

6.3.5 Content. The SFP should concentrate on the most significant hydrometeorological conditions expected to affect major parts or all of the forecast area to keep the forecast from becoming unnecessarily complicated. In general, more detail should be found in the earlier periods. The SFP should contain the following weather elements (except where noted):

- a. Headlines. Headlines should be consistent with the format described for the ZFP found in section 2.3.5.2.
- b. References to Holidays. Ten federally recognized U.S. national holidays and (Federal) will be used to identify the daytime or combined day/night periods instead of the days of the week (see ZFP section 2.3.5.1 for specific holidays).

- c. Precipitation. When precipitation is forecast, specify and, if necessary, qualify the type and intensity, e.g., "LIGHT RAIN," or "HEAVY SNOW," "DRIZZLE." To describe the likelihood of precipitation, use POP qualifying terms of uncertainty such as "CHANCE," and "LIKELY." Actual POP percentages are not used in the SFP. Modifying terms should be used to describe the amount of area to be affected for convective situations, e.g., "ISOLATED," "NUMEROUS," etc. For stratiform precipitation, terms of duration, e.g., "BRIEF," "OCCASIONAL," and "FREQUENT," should be used. Do not combine **qualifying** and **areal** terms, or **duration qualifiers** with **qualifying** or **areal** terms as discussed in ZFP section 2.3.5.3, part C.
- d. Maximum/Minimum Temperature. For each day and night period in the 12-hour forecast periods, include the expected maximum and minimum temperature, respectively. For 24-hour combined periods enter the minimum temperature first, followed by the maximum temperature.

If significant, temperature trends (i.e., highs or lows varying by about 10 degrees or more than previous highs or lows) should be included. For example, "MUCH WARMER WITH LOWS IN THE 70S AND HIGHS IN THE 80S". The statement on forecast temperatures should be as simple as possible, yet it should note the extremes that exist. It is not intended that every variance in temperature be covered; in some mountainous, coastal, or hilly areas, the full delineation of temperature extremes is impractical.

If the temperature is expected to fall throughout the day, rise throughout the night, or remain steady, indicate the temperature expected at the end of that specified time (primarily in the 12-hour forecast periods).

Numerical temperature values should be presented in either of the following two ways.

- (1) A general range where the terms are defined as follows.
 "LOWER 50S" (50, 51, 52, 53, 54)
 "MID 50S" (53, 54, 55, 56, 57)
 "UPPER 50S" (56, 57, 58, 59)
 "60S" (60 through 69)
- (2) A specific range--rounded to the nearest 5 or zero. For ranges below 10 or above 100, any numbers may be used.
 "40 TO 45"
 "5 BELOW TO 15 BELOW ZERO"
 "102 TO 108"

- e. Sky Condition. The predominant sky condition will be included in each 12-hour forecast period. For combined periods, the sky condition may be omitted if it can be inferred from a forecast of precipitation.
- f. Wind. The forecast should include wind direction and speed and their associated descriptive terms in the 12-hour periods when significant (generally sustained 25 mph or greater). Use the associated descriptive terminology within the 24-hour periods of the forecast. See table 4 for the acceptable descriptive terminology for wind (sustained 25 mph or greater).
- g. Other Elements. The 12-hour periods of the SFP will include other elements, if considered significant, e.g., wind chill, heat and humidity, frost, freeze conditions, fog, other obstructions to visibility (when 1/4 mile or less), etc. Include fog whenever it is dense enough to contribute to hazardous driving conditions. Mention frost if it is expected to affect a large part of the forecast area. These elements may also be entered into any of the 24-hour periods at regional discretion.

6.3.5.1 References to Locations. If significant conditions are expected in only part of the forecast area, this should be clearly specified. If the weather distribution is caused by topography, then accepted topographic divisions, such as mountains, valleys, coast, shore, Plains, etc., should be used. In other cases commonly understood subdivision terms, such as "panhandle," or general phrases, such as "northwest Iowa" or "southeast Texas", may be used. Long and/or confusing combinations should be avoided.

6.4 Updates, Amendments, and Corrections. At a minimum, the SFP should be updated as soon as practical whenever Long Duration Hazardous Weather conditions (as defined in Appendix B) dictate a change to Long Duration Hazardous Weather Headlines highlighting an SFP. Corrections will be used to indicate an error (typographic, mislabeling, etc., not forecaster judgment) was made in the previously issued forecast.

7. **Tabular State Forecast Product (product category SFT).**

7.1 Mission Connection. The SFT is a general public forecast of hydrometeorological conditions at specific locations over a WFO's geographic area of responsibility and/or an entire state through Day 7. While the forecast area typically includes part of one or more states, designated WFOs issue the SFT for specified locations to adequately represent forecast conditions across one entire state. In some locations, generation of entire state SFTs will become available when fully supported by automated software.

7.2 Issuance Guidelines.

7.2.1 Creation Software. The SFT is automatically generated by the AWIPS IFPS software.

7.2.2 Issuance Criteria. The SFT is issued twice daily by all WFOs. However, Regional Headquarters may prescribe the issuance of the narrative SFP in lieu of, or in addition to the SFT.

7.2.3 Issuance Time. The SFT should be issued within 1-hour following the mandatory ZFP releases (which occur no later than 4:00 a.m. and 4:00 p.m. local time).

7.2.4 Valid Time. The SFT is valid from the time of release through Day 7.

7.2.5 Product Expiration Time. The SFT expiration time is 15 hours after initial time of issuance.

7.3 Technical Description. The SFT is defined by the format and content described in this section.

7.3.1 UGC Type. The Tabular State Forecast Product will use the “Z” form of the UGC to identify the zone area that each city included in the forecast represents.

7.3.2 MND Broadcast Instruction Line. Not applicable.

7.3.3 MND Product Type Line. The MND header is “TABULAR STATE FORECAST PRODUCT FOR [state/area].”

7.3.4 Content. The SFT will be a tabular seven-day forecast for selected locations across a state or a defined area.

7.3.4.1 Product Header.

- a. Product Identifier. The SFT header will contain the standard WMO identifier along with the day and time of the product, followed by the AWIPS identifier:

```
ttaaaii cccc ddhhmm
SFTxxx
```

where xxx is either the standard two-letter state identification (for a whole state forecast) or the 3-letter WFO identification (for an area forecast).

- b. Zone Identification Numbers. The zone identification numbers of the zones that are included in the state forecast are listed on the line after the product header. This list includes all of the zones for a given state or only a partial list for area forecasts. The zones incorporated in the product will include those which contain locations listed in the SFT, as well as some adjacent and intervening zones:

```
stZxxx-xxx>xxx-ddhhmm- (use all zones for whole state)
stZxxx-xxx>xxx-stZxxx-ddhhmm- (repeat state id for multiple parts
of states)
```

- c. MND Header. The final portion of the header will contain the narrative description of the forecast product, the WFO, and the date and time of the product:

```
TABULAR STATE FORECAST FOR [state/area]
NATIONAL WEATHER SERVICE [forecast office, state]
time pm time_zone day mon dd yyyy
```

7.3.4.2 Table Header. The SFT table header will immediately follow the product header and will consist of eight columns and three rows. The first row will contain the word “FCST” for each forecast period. The second and third rows include the forecast periods and dates (month/day) in columns two through seven (bolded text is included in forecasts as shown).

(Morning)	FCST	FCST	FCST	FCST	FCST	FCST	FCST
	TODAY	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7
	MMM DD	MMM DD	MMM DD	MMM DD	MMM DD	MMM DD	MMM DD

(Evening)	FCST	FCST	FCST	FCST	FCST	FCST	FCST
	TOMORROW	DAY 2	DAY 3	DAY 4	DAY 5	DAY 6	DAY 7
	MMM DD	MMM DD	MMM DD	MMM DD	MMM DD	MMM DD	MMM DD

7.3.4.3 Significant Weather. For each row containing a city in the first column of the table, a single word and/or abbreviation (up to 7 characters) will be used to characterize the predominant daytime weather for each period. Daytime is defined as 6 a.m. to 6 p.m. local time. See section 8.3.3.2 for the list of valid weather abbreviations.

7.3.4.4 Temperature. Forecasted maximum and minimum temperatures in degrees Fahrenheit will appear beneath the significant weather row in each section containing a city in the table. Maximum temperatures are valid for the period from 7:00 a.m. to 7:00 p.m. local standard time. Minimum temperatures are valid for the period from 7:00 p.m. to 8:00 a.m. local standard time. For morning SFT issuances, the first column only contains a maximum temperature for the current day. Subsequent columns list an early morning LO followed by an afternoon HI for each day. For afternoon SFT issuances, the first column lists the LO and HI temperature for the following day. The LO temperature depicted in the first column is the overnight minimum temperature forecast (normally occurring during the following morning). Similar to the morning forecast issuance, subsequent columns depict an early morning LO followed by an afternoon HI for each day through Day 7.

Mon Morning Issuance	MON /87	TUE 66/88	WED 70/89	THU 68/80	FRI 64/81	SAT 66/84	SUN 63/81
Mon Evening Issuance	TUE 66/89	WED 71/90	THU 69/82	FRI 65/81	SAT 67/86	SUN 63/83	MON 60/79

7.3.4.5 Probability of Precipitation. For each row containing a city in the first column of the table, the daytime (6 a.m. to 6 p.m. local time) probability of precipitation (POP) is included for each of the days. The possible POP categories are: 0, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100. The POP format is shown below.

POP 10 POP 20 POP 0 POP 70 POP 20 POP 100 POP 40

7.3.4.6 Geographical Regions. The SFT program will contain city/location identifications and associated geographical regions. The database tables can be modified to change the geographical region names for the SFT.

```
...STATE/REGION...
  CITY
```

7.3.5 Format. The SFT will follow the early morning and afternoon issuance formats as shown in Figures 26 and 27 (bolded text is included in forecasts as shown). Missing data is indicated by the code, “MM”.

```

      1      2      3      4      5      6
12345678901234567890123456789012345678901234567890123456789
ttaaii cccc ddhhmm
SFTxxx
stZXXX-XXX>XXX-ddhhmm-

TABULAR STATE FORECAST FOR [state/region]
NATIONAL WEATHER SERVICE [forecast office, state]
time am time_zone day mon dd yyyy

ROWS INCLUDE...
  DAILY PREDOMINANT DAYTIME WEATHER 6AM-6PM
  FORECAST TEMPERATURES...EARLY MORNING LOW/DAYTIME HIGH
  PROBABILITY OF PRECIPITATION 6AM-6PM
  - INDICATES TEMPERATURES BELOW ZERO
  MM INDICATES MISSING DATA

  FCST      FCST      FCST      FCST      FCST      FCST      FCST
TODAY      DAY 2      DAY 3      DAY 4      DAY 5      DAY 6      DAY 7
MON DD      MON DD      MON DD      MON DD      MON DD      MON DD      MON DD

...STATE/REGION 1...
CITY 1
WXWXWX  WXWXWX  WXWXWX  WXWXWX  WXWXWX  WXWXWX  WXWXWX
/ HI     LO/ HI   LO/ HI   LO/ HI   LO/ HI   LO/ HI   LO/ HI
POP ###  POP ###  POP ###  POP ###  POP ###  POP ###  POP ###

CITY 2
WXWXWX  WXWXWX  WXWXWX  WXWXWX  WXWXWX  WXWXWX  WXWXWX
/ HI     LO/ HI   LO/ HI   LO/ HI   LO/ HI   LO/ HI   LO/ HI
POP ###  POP ###  POP ###  POP ###  POP ###  POP ###  POP ###
.        .        .        .        .        .        .
.        .        .        .        .        .        .
.        .        .        .        .        .        .

CITY 3
WXWXWX  WXWXWX  WXWXWX  WXWXWX  WXWXWX  WXWXWX  WXWXWX
/ HI     LO/ HI   LO/ HI   LO/ HI   LO/ HI   LO/ HI   LO/ HI
POP ###  POP ###  POP ###  POP ###  POP ###  POP ###  POP ###

...STATE/REGION 2...
CITY 2
WXWXWX  WXWXWX  WXWXWX  WXWXWX  WXWXWX  WXWXWX  WXWXWX
/ HI     LO/ HI   LO/ HI   LO/ HI   LO/ HI   LO/ HI   LO/ HI
POP ###  POP ###  POP ###  POP ###  POP ###  POP ###  POP ###

ETC...

$$

```

Figure 26. Tabular State Forecast - Morning Issuance Format.

```

      1      2      3      4      5      6
12345678901234567890123456789012345678901234567890123456789
ttaaii cccc ddhhmm
SFTxxx
stZXXX-XXX>XXX-ddhhmm-

TABULAR STATE FORECAST FOR [state/region]
NATIONAL WEATHER SERVICE [forecast office, state]
time pm time_zone day mon dd yyyy

ROWS INCLUDE...
  DAILY PREDOMINANT DAYTIME WEATHER 6AM-6PM
  FORECAST TEMPERATURES...EARLY MORNING LOW/DAYTIME HIGH
  PROBABILITY OF PRECIPITATION 6AM-6PM
  - INDICATES TEMPERATURES BELOW ZERO
  MM INDICATES MISSING DATA

FCST      FCST      FCST      FCST      FCST      FCST      FCST
TOMORROW DAY 2      DAY 3      DAY 4      DAY 5      DAY 6      DAY 7
MON DD     MON DD     MON DD     MON DD     MON DD     MON DD     MON DD

...STATE/REGION 1...
CITY 1
WXWXWX  WXWXWX  WXWXWX  WXWXWX  WXWXWX  WXWXWX  WXWXWX
LO/HI    LO/HI    LO/HI    LO/HI    LO/HI    LO/HI    LO/HI
POP ### POP ### POP ### POP ### POP ### POP ### POP ###

CITY 2
WXWXWX  WXWXWX  WXWXWX  WXWXWX  WXWXWX  WXWXWX  WXWXWX
LO/HI    LO/HI    LO/HI    LO/HI    LO/HI    LO/HI    LO/HI
POP ### POP ### POP ### POP ### POP ### POP ### POP ###
.        .        .        .        .        .        .
.        .        .        .        .        .        .
.        .        .        .        .        .        .

CITY 3
WXWXWX  WXWXWX  WXWXWX  WXWXWX  WXWXWX  WXWXWX  WXWXWX
LO/HI    LO/HI    LO/HI    LO/HI    LO/HI    LO/HI    LO/HI
POP ### POP ### POP ### POP ### POP ### POP ### POP ###

...STATE/REGION 2...
CITY 2
WXWXWX  WXWXWX  WXWXWX  WXWXWX  WXWXWX  WXWXWX  WXWXWX
LO/HI    LO/HI    LO/HI    LO/HI    LO/HI    LO/HI    LO/HI
POP ### POP ### POP ### POP ### POP ### POP ### POP ###

ETC...

$$

```

Figure 27. Tabular State Forecast - Afternoon Issuance Format.

7.4 Updates, Amendments and Corrections. Corrections are issued for all routine or non-routine SFT issuances to indicate an error was made in the previously issued forecast. When a

correction is needed, reissue the entire SFT. Updates are issued when temperatures or significant weather do not accurately reflect the most current forecast.

8. **Coded Cities Forecast (product category CCF).**

8.1 **Mission Connection.** WFOs issue CCFs for both internal and external uses. CCFs are abbreviated forecasts for particular cities/locations within a WFO's area of responsibility. CCFs serve as input for the Selected Cities Weather Summary and Forecasts and Travelers' Forecasts, and may be used as input to the Tabular State Forecast Product. The private sector uses the CCF to compare with their forecasts for specific cities/locations.

8.2 **Issuance Guidelines.**

8.2.1 **Creation Software.** The CCFs may be generated automatically by software formatters, or composed manually using the AWIPS text editor or any other text editor.

8.2.2 **Issuance Criteria.** The CCF is a routine product issued twice daily by all WFOs.

8.2.3 **Issuance Time.** CCFs will be transmitted twice daily; in the morning (between 0700 UTC and 1000 UTC) and in the afternoon (between 1900 and 2200 UTC).

8.2.4 **Valid Time.** CCFs are valid according to the schedule shown in Table 17:

Issuance Time	Beginning	Ending
07-10 UTC, Daily	Today, 12 UTC	see Sect. 8.3.4
19-22 UTC, Daily	Tonight, 00 UTC	see Sect. 8.3.4

Table 17. CCF Issuance Schedule.

8.2.5 **Product Expiration Time.** Product expires with the next issuance.

8.3 **Technical Description.** CCFs will follow the format and content described in this section.

8.3.1 **MND Broadcast Line.** Not applicable.

8.3.2 **MND Header.** Not applicable.

8.3.3 **Content.** Each CCF will contain the following elements as shown in Table 18. Specific details on each element are described in the sections following the table.

Element	Meaning
LLL	Location Identifier

F_i , where $i = 1, 2$, etc.	One-Word Daytime Forecast
T_{\max}	Maximum Temperature
T_{\min}	Minimum Temperature
NN	Forecaster Number
P_i , where $i = 1, 2$, etc.	Probability of Precipitation

Table 18. CCF Elements and Meaning.

8.3.3.1 Location Identifier. LLL is a 3-character identifier for U.S. cities, airports, etc., and will be specifically listed in either the NWS or DOT/FAA Location Identifiers Handbooks.

8.3.3.2 One-Word Daytime Forecasts. F_1, F_2, F_3 , etc., are single letters which represent one-word daytime forecasts for the predominant weather expected during daylight hours. The list below gives the corresponding letters and weather elements.

U	SUNNY	L	DRZL (drizzle)
V	CLEAR	R	RAIN
A	FAIR	O	RNSNOW (mixed precipitation)
B	PTCLDY (partly cloudy)	S	SNOW
E	MOCLDY (mostly cloudy)	J	SNOSHR (snow showers)
C	CLOUDY	M	FLRRYS (snow flurries)
G	VRYHOT (very hot or hot/humid)	P	BLZZRD (blizzard)
I	VRYCLD (very cold/wind chill)	Q	BLGSNO (blowing snow)
F	FOGGY	W	SHWRS (showers)
H	HAZE	T	TSTRMS (thunderstorms)
K	SMOKE	X	SLEET
D	DUST	Y	FZRAIN (freezing rain)
N	WINDY	Z	FZDRZL (freezing drizzle)

The break-out of the one-word forecasts depends on the issuance time:

Issuance Time (UTC)	Sequence	Represents Forecast For
07-10	$F_1 F_2 F_3$, etc.	Today, Day 2, Day 3, etc.
19-22	$F_1 F_2 F_3$, etc.	Tomorrow, Day 2, Day 3, etc.

Table 19. CCF Wording and Issuance Time.

8.3.3.3 Temperature Forecasts. A maximum and minimum temperature in degrees Fahrenheit are forecast for each forecast period. The maximum and minimum forecast periods are defined

as 7:00 a.m. to 7:00 p.m. and 7:00 p.m. to 8:00 a.m. local standard time respectively. The temperatures are encoded with three digits. For example, 52 degrees is encoded 052, 112 degrees is encoded 112, 7 degrees is encoded 007, and zero degrees is encoded 000. Temperatures below zero are preceded by the digit "9." For example, -15 degrees is encoded 915, -5 degrees is encoded 905.

8.3.3.4 Forecaster Number. Two digits, represented by NN, in digits 01 through 99.

8.3.3.5 Probability of Precipitation (POP). A single code represents each 12-hour period of the CCF. For example:

Issuance Time (UTC)	Sequence	Forecast Periods (UTC)
07-10	P ₁ P ₂ P ₃ P ₄ , etc	Today (12-00), Tonight (00-12), Day 2 (12-00), Day 2 night (00-12), etc.
19-22	P ₁ P ₂ P ₃ P ₄ , etc	Tonight (00-12), Tomorrow (12-00), Tomorrow night (00-12), Day 2 (12-00), etc.

Table 20. Probability of Precipitation Issuance and Forecast Periods.

The POP codes and their values are as follows:

<u>Code</u>	<u>POP Value (%)</u>	<u>Code</u>	<u>POP Value (%)</u>
0	Near Zero	6	60
-	5	7	70
1	10	8	80
2	20	9	90
3	30	+	Near 100
4	40	/	Missing
5	50		

Table 21. POP Codes and Associated Values.

If the probability forecast is 50 percent or greater, the corresponding one-word forecast should normally be for a precipitation event. However, if there is a high POP that applies very early in the day, then a non-precipitation forecast would likely be the dominant forecast.

8.3.3.6 Snowfall Amount (optional). An optional entry indicating forecast snow amounts may be included.

Issuance Time (UTC)	Snowfall Range (in inches)	Forecast Periods (UTC)
---------------------	----------------------------	------------------------

07-10	aaaa/bbbb/cccc	Today (12-00), Tonight (00-12), Day 2 (12-00)
19-22	aaaa/bbbb/cccc	Tonight (00-12), Tomorrow (12-00), Tomorrow Night (00-12)

Table 22. Snowfall Issuance Times and Forecast Periods.

8.3.4 Format. WFOs will transmit CCFs in one of the following prescribed formats to ensure product utility by multiple users' computers. Elements of the CCF will be consistent regardless of what format is used. Note that the temperature forecasts have a different sequence depending on the transmission time. *Optional snowfall entry is indicated in italics*.

8.3.4.1 Pre-IFPS Format. All pre-IFPS WFOs will minimally produce their CCFs in the following format:

Issuance Time (UTC)	CCF Sequence
07-10	LLL F ₁ F ₂ max/min max/min max NNP ₁ P ₂ P ₃ aaaa/bbbb/cccc
19-22	LLL F ₁ F ₂ min/max min/max min NNP ₁ P ₂ P ₃ aaaa/bbbb/cccc

Table 23. Minimum Pre-IFPS CCF Format.

Pre-IFPS WFOs may, at their discretion, produce a seven-day CCF (per section 8.3.4.2).

8.3.4.2 IFPS Format. IFPS sites will produce a seven-day CCF in the following format. Note the first line is identical to the two-day CCF, above.

07-10 UTC Issuance – CCF Sequence
LLL F ₁ F ₂ max/min max/min max NNP ₁ P ₂ P ₃ aaaa/bbbb/cccc F ₃ F ₄ F ₅ F ₆ F ₇ min/max min/max min/max min/max P ₄ P ₅ P ₆ P ₇ P ₈ P ₉ P ₁₀ P ₁₁ P ₁₂ P ₁₃

Table 24. IFPS Site Seven-Day 07-10 UTC Issuance CCF Format.

19-22 UTC Issuance – CCF Sequence
LLL F ₁ F ₂ min/max min/max min NNP ₁ P ₂ P ₃ aaaa/bbbb/cccc F ₃ F ₄ F ₅ F ₆ F ₇ max/min max/min max/min max/min max/min max/min max/min P ₄ P ₅ P ₆ P ₇ P ₈ P ₉ P ₁₀ P ₁₁ P ₁₂ P ₁₃ P ₁₄

Table 25. IFPS Site Seven-Day 19-22 UTC Issuance CCF Format.

Examples of CCF Messages. CCF messages for different stations are shown below.

Pre-IFPS Format CCF:

FPUS43 KABR 120903
CCFABR

ABR SN 038/022 035/018 032 06982 0406/0204/0000
next city...

Description: This is a 2-day CCF, transmitted at 0903 UTC. Decoding follows the format specified above for the ‘morning’ CCF. The forecast for ABR (Aberdeen, SD) is for snow (S) today and windy conditions (N) tomorrow. High temperature today will be 38°F, low tonight 22°F. High temperature on Day 2 will be 35°F, low Day 2 Night will be 18°F. The high temperature on Day 3 is forecast to be 32°F. The forecaster number is 06. The POP today (12-00 UTC) is 90% (coded as 9), tonight (00-12 UTC) is 80% (coded as 8), and tomorrow (12-00 UTC) is 20% (coded as 2). The final entry is the optional snowfall forecast in inches: 4-6 inches today (12-00 UTC) (coded as 0406), 2-4 inches tonight (00-12 UTC) (coded as 0204), and 0 inches on Day 2 (tomorrow).

IFPS Format CCF:

FPUS41 KBOX 121953
CCFBOS

BOS AB 057/070 055/077 053 13001
CAABA 063/055 066/050 067/051 074/057 066 29440000442
next city...

Description: This is a 7-day CCF for BOS (Boston, MA), transmitted at 1953 UTC. Decoding follows the format specified above for the ‘afternoon’ CCF. The line one decoding process is already addressed and is not repeated here. {Note: No entry for optional snowfall forecast following the forecaster number and POP entry (13001). This can be either empty or indicated by 0000/0000/0000.}

Line two, highlighted, starts the expanded coded forecast for Days 3-7. The first five letters represent the one-word forecast for daylight hours. The decoding is as follows: the forecast for Day 3 is cloudy (C), Days 4, 5 and 7, is mostly sunny (A) and Day 6 is partly cloudy (B). The next several numbers are maximum/minimum temperatures for each day. In this example the forecast highs for Days 3-7 are: 63°F, 66°F, 67°F, 74°F and 66°F. The forecast lows for Days 4-7 are: 55°F, 50°F, 51°F, and 66°F. The final series of numbers are 12-hour forecast POPs: the POP for Day 2 (12-00 UTC) is 20% (2); Day 2 night (00-12 UTC) is 90% (9); Day 3 (12-00 UTC) is 40% (4); Day 3 night (00-12 UTC) is 40% (4); Day 4 (12-00 UTC) is near 0% (0); Day 4 night (00-12 UTC) is near 0% (0); Day 5 (12-00 UTC) is near 0% (0); Day 5 night (00-12 UTC) is near 0% (0); Day 6 (12-00 UTC) is 40 percent (4); Day 6 night (00-12 UTC) is 40% (4); and Day 7 (12-00 UTC) is 20% (2).

8.4 Updates, Amendments, and Corrections. CCFs will be updated and corrected between routine issuances when the on-duty forecast team believes the current CCF is not representative, or a typographical/format error is detected.

9. **Recreation Report (product category REC).**

9.1 **Mission Connection.** The Recreation Report (REC) relays reports on conditions for resorts and recreational areas. This report, which may also contain forecast information, is for the general public.

9.2 **Issuance Guidelines.**

9.2.1 **Creation Software.** The REC may be composed using the AWIPS text editor or any other text editor.

9.2.2 **Issuance Criteria.** The REC does not have mandatory issuance criteria. Issuance criteria should be determined based upon customer needs.

9.2.3 **Issuance Time.** The REC is a non-scheduled product issued on an as needed basis. Release times should be determined locally based upon customer needs.

9.2.4 **Valid Time.** RECs are valid from the time of release until the next issuance.

9.2.5 **Product Expiration Time.** The REC product expiration time is determined locally.

9.2.6 **Event Expiration Time.** Not applicable.

9.3 **Technical Description.**

9.3.1 **UGC Type.** The REC may use Zone coding or descriptive geographic terminology, as appropriate.

9.3.2 **MND Broadcast Instruction Line.** The REC does not contain an MND Broadcast Instruction Line.

9.3.3 **MND Product Type Line.** The REC does not have a mandatory MND. The MND should be descriptive in nature and determined based upon customer needs.

9.3.4 **Content.** The REC may contain the entire range of meteorological variables, e.g., sky condition, weather, wind, temperature, snow depth, tides, water temperature, etc. Specific content should be determined based upon customer needs.

9.3.5 **Format.** The REC is a free-form text product.

SXaaii cccc ddhhmm	<i>(WMO Heading)</i>
RECxxx	<i>(AWIPS ID)</i>
stZ.....	<i>(UGC:Zone, if applicable)</i>
RECREATION FORECAST (or similar)	<i>(MND)</i>
NATIONAL WEATHER SERVICE city st	<i>(Issuing Office)</i>
time am/pm time_zone day mmm dd yyyy	<i>(Issuing time and date)</i>
[TEXT]	
\$\$	<i>(UGC Delimiter)</i>
Name/Initials/Fcstr ID	<i>(Optional)</i>

Figure 28. Recreational Forecast Generic Format.

9.4 Updates, Amendments, and Corrections. Corrections are issued as required Updates are issued based upon customer needs.

APPENDIX A - Product Guidelines and Examples

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1. Zone Forecast Product Guidelines and Examples.

1.1 Zone Forecast Product Segment.

COZ082-170200-
 PIKES PEAK ABOVE 11000 FT-
 INCLUDING...THE SUMMIT OF PIKES PEAK
 400 AM MST THU JAN 16 2003

.TODAY...MOSTLY SUNNY. HIGHS 13 TO 18. NORTHWEST WINDS 15 TO 25 MPH
 WITH GUSTS TO AROUND 55 MPH.
 .TONIGHT...PARTLY CLOUDY. WINDY. LOWS 4 TO 7 BELOW ZERO. NORTHWEST
 WINDS 20 TO 30 MPH WITH GUSTS TO AROUND 45 MPH.
 .FRIDAY...PARTLY SUNNY. HIGHS IN THE LOWER TO MID 20S. NORTHWEST
 WINDS 20 TO 30 MPH.
 .FRIDAY NIGHT...PARTLY CLOUDY. LOWS ZERO TO 7 BELOW. NORTHWEST
 WINDS 20 TO 30 MPH.
 .SATURDAY...PARTLY SUNNY. HIGHS IN THE 20S. WEST WINDS 10 TO 20 MPH.
 .SATURDAY NIGHT...MOSTLY CLEAR. LOWS 1 TO 8 ABOVE ZERO.
 .SUNDAY...PARTLY CLOUDY. HIGHS IN THE MID 20S TO MID 30S.
 .SUNDAY NIGHT...PARTLY CLOUDY. LOWS 2 TO 7 ABOVE ZERO.
 .MARTIN LUTHER KING JR DAY...MOSTLY CLOUDY. HIGHS IN THE LOWER TO
 MIDDLE 30S.
 .MONDAY NIGHT...PARTLY CLOUDY. LOWS 2 TO 7 ABOVE ZERO.
 .TUESDAY...PARTLY CLOUDY. HIGHS IN THE MID TO UPPER 20S.
 .TUESDAY NIGHT...MOSTLY CLOUDY. LOWS 2 TO 9 ABOVE ZERO.
 .WEDNESDAY...MOSTLY CLOUDY. SLIGHT CHANCE OF SNOW SHOWERS. HIGHS 17
 TO 28. CHANCE OF SNOW 20 PERCENT.

\$\$

1.2 Dry in the Morning. Precipitation in the Afternoon.

.SATURDAY...MOSTLY CLOUDY IN THE MORNING...THEN SNOW LIKELY IN THE
 AFTERNOON. HIGHS IN THE LOWER 20S. NORTH WINDS 10 TO 20 MPH BECOMING WEST
 EARLY IN THE AFTERNOON. CHANCE OF SNOW 60 PERCENT. *(Sky condition needed for
 the morning forecast, but is not necessary with the 60% POP in the afternoon.)*

1.3 Falling Temperatures.

.TONIGHT...RAIN ENDING AFTER MIDNIGHT AND BECOMING WINDY. NORTHWEST WINDS 20
 TO 30 MPH WITH GUSTS TO AROUND 40 MPH. TURNING COLDER WITH LOWS NEAR 40.
 .TUESDAY...CLEARING...WINDY AND MUCH COLDER. TEMPERATURES FALLING INTO THE
 LOWER 30S BY LATE AFTERNOON. NORTHWEST WINDS 20 TO 30 MPH SLOWLY DIMINISHING
 TOWARD EVENING.
 .TUESDAY NIGHT...CLEAR AND BITTERLY COLD WITH LOWS OF ZERO TO 5 BELOW. LIGHT
 AND VARIABLE WINDS.
 .WEDNESDAY...SUNNY BUT CONTINUED VERY COLD. HIGHS 12 TO 17. WEST WINDS
 AROUND 10 MPH.

1.4 Severe Weather Potential.

...TORNADO WATCH IN EFFECT UNTIL 11 PM EDT TONIGHT...

.TONIGHT...NUMEROUS THUNDERSTORMS. SOME THUNDERSTORMS MAY BE SEVERE. LOWS NEAR
 75. SOUTH WINDS 5 TO 10 MPH...EXCEPT GUSTY NEAR THUNDERSTORMS. CHANCE OF RAIN
 70 PERCENT.

1.5 Expected Afternoon Severe Weather.

- a. Moderate risk area from the Storm Prediction Center's Day 1 Outlook...hail and wind are the big threat. No watch is in effect at this time.

.THIS AFTERNOON...SCATTERED THUNDERSTORMS WITH HAIL AND STRONG GUSTY WINDS. PARTLY SUNNY AND BREEZY. HIGHS NEAR 90. SOUTHWEST WINDS 15 TO 25 MPH. CHANCE OF RAIN 40 PERCENT.

- b. High risk area...tornadoes are the big threat. In this case, the Storm Prediction Center has issued a Tornado Watch. Thunderstorms are expected to bring categorical rain to the area. POPs are left out.

...TORNADO WATCH IN EFFECT UNTIL 5 PM CDT THIS AFTERNOON...

.THIS AFTERNOON...THUNDERSTORMS DEVELOPING. SOME THUNDERSTORMS WILL PRODUCE DAMAGING WINDS...LARGE HAIL AND ISOLATED TORNADOES. WINDY. HIGHS NEAR 90. SOUTH WINDS 20 TO 30 MPH WITH GUSTS TO 40 MPH.

1.6 Snowfall Accumulation (1st Three Periods).

...HEAVY SNOW WARNING TONIGHT THROUGH LATE TUESDAY MORNING...
...TOTAL SNOWFALL AMOUNT OF 5 TO 10 INCHES...

.TODAY...FREEZING RAIN AND SLEET...CHANGING TO SNOW IN THE AFTERNOON. SNOW ACCUMULATION OF 1 TO 3 INCHES. TEMPERATURES FALLING INTO THE LOWER 30S. BRISK WITH NORTH WINDS 15 TO 25 MPH.

.TONIGHT...SNOW...HEAVY AT TIMES. ADDITIONAL ACCUMULATION OF 4 TO 7 INCHES. LOWS IN THE MID 20S. NORTHEAST WINDS 10 TO 20 MPH. CHANCE OF SNOW NEAR 100 PERCENT.

.TUESDAY...SNOW TAPERING OFF TO FLURRIES BY AFTERNOON. TOTAL SNOW ACCUMULATION OF 5 TO 10 INCHES. HIGHS NEAR 30. NORTHWEST WINDS 5 TO 15 MPH. CHANCE OF MORNING SNOW 80 PERCENT.

1.7 Wind Chill.

...WIND CHILL ADVISORY TONIGHT...

.TONIGHT...MOSTLY CLEAR AND BITTERLY COLD. LOWS NEAR ZERO...WITH WIND CHILLS AROUND 25 BELOW. NORTHWEST WINDS 15 TO 25 MPH.

1.8 Hurricane and Tropical Storm.

An approaching tropical cyclone. (Note: multiple headlines, and absence of POPs and sky condition; the more important elements appear first.)

...HURRICANE WARNING IN EFFECT TONIGHT...
...TORNADO WATCH IN EFFECT UNTIL 7 PM EDT TONIGHT...
...FLOOD WATCH IN EFFECT THIS AFTERNOON THROUGH TONIGHT...

.THIS AFTERNOON...SHOWERS AND THUNDERSTORMS WITH TORRENTIAL DOWNPOURS. FLOODING POSSIBLE...ESPECIALLY ALONG SMALL RIVERS AND STREAMS. SOME THUNDERSTORMS MAY PRODUCE DAMAGING WIND GUSTS. BECOMING VERY WINDY WITH

NORTHEAST WINDS INCREASING TO 30 TO 40 MPH WITH FREQUENT GUSTS TO 55 MPH. HIGHS 70 TO 75. (POP is optional with categorical precipitation)
 .TONIGHT...HURRICANE FORCE NORTHEAST WINDS 60 TO 75 MPH WITH GUSTS TO 100 MPH DEVELOPING THIS EVENING...SHIFTING NORTHWEST AND DECREASING TO 30 TO 40 MPH AFTER MIDNIGHT. SHOWERS AND THUNDERSTORMS WITH TORRENTIAL DOWNPOURS. LOWS NEAR 70. (POP is optional with categorical precipitation)
 .THURSDAY...PARTLY CLOUDY AND VERY WINDY WITH SCATTERED SHOWERS AND THUNDERSTORMS. WEST WINDS 30 TO 40 MPH IN THE MORNING BECOMING SOUTHWEST AND DECREASING TO 15 TO 25 MPH DURING THE AFTERNOON. HIGHS NEAR 80. CHANCE OF RAIN 40 PERCENT.

\$\$

2. AFD Example with Discussion, Marine, Fire Weather, & Prelim Temps/POPs Sections.

FXUS64 KMOB 081847
 AFDMOB

AREA FORECAST DISCUSSION
 NATIONAL WEATHER SERVICE MOBILE AL
 147 PM CDT WED MAY 8 2002

.DISCUSSION...THE LIGHT SOUTHERLY FLOW TONIGHT ALONG WITH A CAPPING INVERSION ALOFT FROM THE DEEP RIDGING OVER THE AREA WILL ALLOW FOR LOW CLOUDS AND PATCHY FOG TO FORM OVER THE AREA TONIGHT. THE WEAK FRONT APPROACHING THE AREA WILL SETTLE ACROSS THE NORTHERN PORTION OF THE FORECAST AREA BY 12Z FRIDAY. THE RIDGING ALOFT AND CAP WEAKEN SOMEWHAT THROUGH FRIDAY AS THE H5 TROF NOSES INTO THE SOUTHEAST STATES. CAPES NEAR 1500 EXPECTED TO DEVELOP NEAR THE FRONT ON FRIDAY...ALTHOUGH THE RATHER WEAK FRONT WILL HAVE TO CONTRIBUTE SUFFICIENT MECHANICAL LIFTING TO OVERCOME WHAT REMAINS OF THE CAP. WILL STAY WITH SLIGHT CHANCE TO CHANCE POPS IN THE CURRENT PACKAGE FOR FRIDAY.

THE WEAK FRONT THEN RETURNS AS A WARM FRONT BY EARLY SATURDAY MORNING AS A SYSTEM ADVANCES FROM THE WEST AND INTO THE CENTRAL PLAINS. THIS NEXT SYSTEM WILL EVENTUALLY BRING A TRAILING FRONT THROUGH THE FORECAST AREA ON MONDAY NIGHT. THE 00Z CANADIAN RUN ALSO HAS THIS TRAILING FRONT APPROACHING THE AREA...BUT IS ABOUT 12 HOURS SLOWER THAN THE CURRENT GFS. AS THE 00Z GFS ENSEMBLE POPS FOR TUESDAY AND WEDNESDAY ARE STILL IN THE SLIGHT CHANCE RANGE...WILL STAY WITH THE SLIGHT CHANCE POPS IN THE EXTENDED PACKAGE FOR NOW...WITH NO POPS FOR WEDNESDAY.

&&

.MARINE...A LIGHT TO MODERATE SOUTHERLY WIND FLOW WILL CONTINUE THROUGH THE WEEKEND WITH SEAS RANGING FROM 2 TO 4 FEET. AS AFTERNOON TO EVENING WINDS WILL INCREASE TO NEAR 15 KNOTS ON THURSDAY THROUGH SATURDAY...WILL CONTINUE WITH A SLIGHT CHANCE FOR RIP CURRENTS. TIDAL RANGES INCREASE TO NEAR 2 FEET BY MONDAY.

&&

.FIRE WEATHER...WARM SOUTHERLY WINDS WILL KEEP AFTERNOON RELATIVE HUMIDITIES ABOVE CRITICAL LEVELS. WINDS INCREASING TO NEAR 15 MPH DURING THE AFTERNOON WILL RESULT IN DISPERSION INDICES APPROACHING 75...BUT ARE EXPECTED TO REMAIN BELOW CRITICAL LEVELS.

&&

.PRELIMINARY POINT TEMPS/POPS...
 MOBILE 70 90 69 89 70/ 00 00 00 20
 PENSACOLA 74 89 71 88 72/ 00 00 00 20
 DESTIN 75 85 74 85 74/ 00 00 00 20
 EVERGREEN 68 92 68 89 67/ 00 00 00 20

WAYNESBORO 67 91 67 88 67/ 00 20 10 30
CAMDEN 67 91 67 88 67/ 00 10 10 30
&&

.MOB WATCHES/WARNINGS/ADVISORIES...
AL...NONE.
FL...NONE.
MS...NONE.
&&

\$\$

NAME/INITIALS/FCSTR ID (Optional)

3. State Forecast Product (SFP) Guidelines and Examples.

3.1 One Geographic Segment.

FPUS63 KTOP 260844
SFPKS
KSZ001>024-026>056-058-059-061>072-074>096-098>100-262344-

STATE FORECAST FOR KANSAS
NATIONAL WEATHER SERVICE TOPEKA KS
344 AM CDT WED JUN 26 2002

.TODAY...PARTLY CLOUDY. A SLIGHT CHANCE OF THUNDERSTORMS SOUTHEAST...WITH A
CHANCE ELSEWHERE. HIGHS 90 TO 95.
.TONIGHT...PARTLY CLOUDY WITH A CHANCE FOR SHOWERS AND THUNDERSTORMS
STATEWIDE. LOWS FROM NEAR 60 NORTHWEST TO THE UPPER 60S EAST.
.THURSDAY...A CHANCE FOR THUNDERSTORMS WEST AND SOUTH...DECREASING CLOUDS
NORTHEAST. HIGHS FROM THE UPPER 80S EAST TO THE LOWER AND MIDDLE 90S WEST.
.FRIDAY...PARTLY CLOUDY. LOWS 55 TO 60. HIGHS FROM THE UPPER 80S TO LOWER
90S.
.SATURDAY AND SUNDAY...CLEAR TO PARTLY CLOUDY. LOWS 60 TO 65.

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3.2 Multiple Geographic Segments and Multiple Offices.

FPUS65 KTFX 211015
SFPMT

STATE FORECAST FOR MONTANA
NATIONAL WEATHER SERVICE
415 AM MDT FRI MAY 24 2002

MTZ001>007-043-250115-
WEST OF THE CONTINENTAL DIVIDE-
NATIONAL WEATHER SERVICE MISSOULA MT
415 AM MDT FRI MAY 24 2002

...FLOOD WARNINGS REMAIN IN EFFECT THROUGH TONIGHT...

.TODAY...PARTLY CLOUDY SOUTH...CHANCE OF SHOWERS NORTH. HIGHS 55 TO NEAR 70.
.TONIGHT...BECOMING MOSTLY CLOUDY WITH A SLIGHT CHANCE OF MOUNTAIN SHOWERS
OVERNIGHT. LOWS 35 TO 45.

.SATURDAY...MOSTLY CLOUDY WITH A CHANCE OF SHOWERS...POSSIBLY A THUNDERSTORM.
HIGHS 65 TO 70.
.SUNDAY...MOSTLY CLOUDY WITH A CHANCE OF SHOWERS...POSSIBLY A THUNDERSTORM.
LOWS 38 TO 43. HIGHS 65 TO 72.
.MEMORIAL DAY THROUGH TUESDAY...PARTLY CLOUDY WITH A SLIGHT CHANCE OF SHOWERS
EACH DAY. LOWS 40 TO 50. HIGHS 65 TO 75.

\$\$

MTZ009>014-044>051-054-250115-
CENTRAL MONTANA-
NATIONAL WEATHER SERVICE GREAT FALLS MT
415 AM MDT FRI MAY 24 2002

.TODAY...WARMER AND PARTLY CLOUDY. HIGHS 50 TO 60.
.TONIGHT...BECOMING MOSTLY CLOUDY. LOWS 35 TO 40.
.SATURDAY...CONTINUED WARMING. MOSTLY CLOUDY WITH A CHANCE OF LATE AFTERNOON
SHOWERS SOUTH. HIGHS 65 TO 70.
.SUNDAY...MOSTLY CLOUDY WITH A CHANCE OF SHOWERS. LOWS 40 TO 45. HIGHS 65 TO
70. GUSTY WINDS TO 30 MPH POSSIBLE NEAR SHOWERS.
.MEMORIAL DAY...MOSTLY CLOUDY WITH A SLIGHT CHANCE OF AFTERNOON SHOWERS. LOWS
IN THE LOWER 40S. HIGHS NEAR 70.
.TUESDAY...PARTLY CLOUDY. A SLIGHT CHANCE OF AFTERNOON SHOWERS. LOWS 35 TO
40. HIGHS IN THE LOWER 70S.

\$\$

MTZ008-015-052-053-055-250115-
SOUTHWEST MONTANA-
NATIONAL WEATHER SERVICE GREAT FALLS MT
415 AM MDT FRI MAY 24 2002

.TODAY...WARMER AND BECOMING PARTLY CLOUDY. HIGHS 50 TO 60.
.TONIGHT...MOSTLY CLOUDY. LOWS 25 TO 35
.SATURDAY...MOSTLY CLOUDY AND WARMER. A CHANCE OF SHOWERS. HIGHS 55 TO 65.
GUSTY WINDS TO 30 MPH POSSIBLE NEAR SHOWERS.
.SATURDAY NIGHT...MOSTLY CLOUDY. LOWS 30 TO 40.
.SUNDAY...MOSTLY CLOUDY AND WARMER. CHANCE OF SHOWERS. GUSTY WINDS TO 35 MPH
POSSIBLE NEAR SHOWERS. HIGHS 55 TO 65.
.MEMORIAL DAY...MOSTLY CLOUDY WITH A CHANCE OF SHOWERS. LOWS IN THE 30S.
HIGHS IN THE 50S TO LOWER 60S.
.TUESDAY...PARTLY CLOUDY. A SLIGHT CHANCE OF SHOWERS. LOWS 35 TO 40. HIGHS
68 TO 73.

\$\$

MTZ016>042-056>062-250115-
EASTERN AND SOUTHERN MONTANA-
NATIONAL WEATHER SERVICE BILLINGS/GLASGOW MT
415 AM MDT FRI MAY 24 2002

.TODAY...MOSTLY CLOUDY EAST WITH ISOLATED SHOWERS OR SPRINKLES NORTHEAST.
PARTLY CLOUDY SOUTHWEST. HIGHS IN THE MID 50S TO MID 60S.
.TONIGHT...MOSTLY CLOUDY WEST. A SLIGHT CHANCE OF SHOWERS EAST. LOWS 35 TO
45.
.SATURDAY...PARTLY CLOUDY EAST. MOSTLY CLOUDY WITH A SLIGHT CHANCE OF SHOWERS
WEST. HIGHS 55 TO 65 NORTH...65 TO 75 SOUTH.
.SUNDAY...PARTLY CLOUDY. CHANCE OF SHOWERS. LOWS IN THE 40S. HIGHS 65 TO 75.
.MEMORIAL DAY...MOSTLY CLOUDY. LOWS IN THE 40S. HIGHS 65 TO 75.
.TUESDAY...PARTLY CLOUDY. LOWS IN THE 40S. HIGHS IN THE 70S.

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3.3 Update and Correction Format Examples.

3.3.1 Update.

FPUS63 KFSD ddhhmm **AAA**
 SFPSD
 SDZ001>074-102130-

STATE FORECAST FOR SOUTH DAKOTA...**UPDATED**
 NATIONAL WEATHER SERVICE SIOUX FALLS SD
 time am time_zone day mon dd yyyy

UPDATED TODAY PERIOD TO ADD SHOWERS

.TODAY...
 .TONIGHT...
 .TOMORROW... etc.

3.3.2 Correction.

FPUS66 KSFO DDHHMM **CCA**
 SFPCA

STATE FORECAST FOR NORTHERN AND CENTRAL CALIFORNIA...**CORRECTED**
 NATIONAL WEATHER SERVICE SACRAMENTO CA
 time am time_zone day mon dd yyyy

CORRECTED ERROR IN NORTHERN CALIFORNIA LOW TEMPERATURE FOR TONIGHT PERIOD

CAZ001-002-005>010-034-037-051-065-074-075-ddhhmm-
 STATE FORECAST FOR COASTAL AREAS
 time am time_zone day mon dd yyyy

.TODAY...
 .TONIGHT...
 .TOMORROW... etc.
 \$\$

CAZ015>019-089>092-DDHHMM-
 STATE FORECAST FOR THE CENTRAL VALLEY
 time am time_zone day mon dd yyyy

.TODAY...
 .TONIGHT...
 .TOMORROW... etc.
 \$\$

4. Recreational Report (REC) Examples.

4.1 Glacier Park Recreational Forecast.

SXUS45 KMSO 161008
 RECMSO

GLACIER PARK RECREATIONAL FORECAST

NATIONAL WEATHER SERVICE MISSOULA MT
400 AM MDT THU MAY 16 2002

MTZ002-162200-
WEST OF THE CONTINENTAL DIVIDE
400 AM MDT THU MAY 16 2002

.TODAY...MOSTLY CLOUDY THIS MORNING. PARTLY CLOUDY THIS AFTERNOON.
HIGHS 58 TO 68.
.TONIGHT...MOSTLY CLEAR. LOWS 33 TO 43.
.FRIDAY...BECOMING MOSTLY CLOUDY. A SLIGHT CHANCE OF SHOWERS
LATE. HIGHS 63 TO 73.
.FRIDAY NIGHT...MOSTLY CLOUDY WITH A SLIGHT CHANCE OF SHOWERS. LOWS
36 TO 46.
.SATURDAY...PARTLY CLOUDY AND WARM...WITH A SLIGHT CHANCE OF
AFTERNOON SHOWERS AND THUNDERSTORMS. HIGHS 68 TO 78.
.SUNDAY AND MONDAY...PARTLY CLOUDY WITH A CHANCE OF SHOWERS AND
THUNDERSTORMS. LOWS 38 TO 48. HIGHS 65 TO 75.
.TUESDAY AND WEDNESDAY...MOSTLY CLOUDY AND BREEZY. A CHANCE OF SHOWERS.
LOWS 36 TO 46. HIGHS 59 TO 69.

\$\$

MTZ009-162200-
EAST OF THE CONTINENTAL DIVIDE
400 AM MDT THU MAY 16 2002

.TODAY...MOSTLY CLOUDY WITH ISOLATED SHOWERS. HIGHS IN THE 40S.
.TONIGHT...BECOMING MOSTLY CLEAR. LOWS IN THE 20S.
.FRIDAY...PARTLY CLOUDY AND WARMER. HIGHS IN THE 50S.
.FRIDAY NIGHT...PARTLY CLOUDY. LOWS IN THE 30S.
.SATURDAY...PARTLY CLOUDY. A CHANCE OF SHOWERS AND THUNDERSTORMS
DURING THE AFTERNOON AND EVENING. HIGHS IN THE 60S.
.SUNDAY AND MONDAY...WARMER AND PARTLY CLOUDY WITH A SLIGHT CHANCE OF SHOWERS
OR THUNDERSTORMS. LOWS 35 TO 45. HIGHS 65 TO 75.
.TUESDAY...MOSTLY CLOUDY WITH A CHANCE OF SHOWERS OR THUNDERSTORMS.
LOWS 35 TO 45. HIGHS 65 TO 75.
.WEDNESDAY...COOLER AND MOSTLY CLOUDY WITH A CHANCE OF SHOWERS. GUSTY WEST
WINDS. LOWS 35 TO 45. HIGHS 55 TO 65.

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4.2 Mount Rainier Recreational Forecast.

SXUS46 KSEW 151638
RECSEA
WAZ018-025-161800-

MOUNT RAINIER RECREATIONAL FORECAST
NATIONAL WEATHER SERVICE SEATTLE WA
1000 AM PDT WED MAY 15 2002

.WEDNESDAY...MOSTLY SUNNY.
.WEDNESDAY NIGHT...PARTLY CLOUDY.
.THURSDAY...PARTLY CLOUDY.
.OUTLOOK FOR FRIDAY...MOSTLY CLOUDY WITH A CHANCE OF RAIN OR SNOW
SHOWERS.

LOCATION	(ELEVATION)	TEMPERATURE (F)	WIND DIR	SPEED (MPH)
SUMMIT	(14410)	5	NW	15-25
CAMP MUIR	(10000)	17	NW	5-15

PARADISE (5500) 45 SW 5-15

FREE AIR FREEZING LEVEL RISING TO 6500 FEET TODAY AND TO 8000 FEET THURSDAY.

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4.3 Recreational and Beach Forecast.

SXUS42 KCHS 160733
RECCHS
SCZ045-162200-

RECREATIONAL FORECAST
NATIONAL WEATHER SERVICE CHARLESTON SC
335 AM EDT THU MAY 16 2002

LAKE MOULTRIE WIND FORECAST.

.TODAY...SOUTH WIND 5 TO 10 KNOTS.
.TONIGHT...SOUTHWEST WIND 5 TO 10 KNOTS.
.FRIDAY...SOUTHWEST WIND 10 TO 15 KNOTS.

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GAZ119-SCZ048-050-162200-

BEACH FORECAST
NATIONAL WEATHER SERVICE CHARLESTON SC
335 AM EDT THU MAY 16 2002

BEACH FORECAST FROM CHARLESTON TO SAVANNAH.

SKIES WILL BE SUNNY TODAY WITH HIGHS OF 75 TO 80 DEGREES.
WINDS WILL BE FROM THE SOUTHEAST 10 TO 15 MPH.

SKIES WILL BE PARTLY CLOUDY ON FRIDAY WITH HIGHS AROUND 80 DEGREES.
EXPECT SOUTH WINDS 5 TO 10 MPH IN THE MORNING INCREASING TO 15 TO 20 MPH IN THE AFTERNOON.

SEAWATER TEMPERATURES ARE IN THE UPPER 70S.

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4.4 Resort Area Forecast.

SXUS41 KAKQ 152104
RECAKQ
MDZ018-022-VAZ071-077-079-095-161300-

RESORT AREA FORECAST
NATIONAL WEATHER SERVICE WAKEFIELD VA
505 PM EDT WED MAY 15 2002

FOR THE ATLANTIC BEACHES FROM SOUTHERN NEW JERSEY THROUGH
NORTHEASTERN NORTH CAROLINA

.OVERNIGHT...MOSTLY CLEAR. LOWS IN THE MID TO UPPER 40S. NEAR SHORE
WAVES 1 TO 2 FEET.

.THURSDAY...PARTLY SUNNY. HIGHS IN THE UPPER 70S AND LOWER 80S. NEAR
SHORE WAVES 2 TO 3 FEET.

THE ULTRAVIOLET INDEX FOR THURSDAY FOR ATLANTIC CITY AND WASHINGTON DC IS
7...NORFOLK IS 8...THESE ARE CONSIDERED HIGH. BALTIMORE IS 6 WHICH IS
CONSIDERED MODERATE.

THE RIP CURRENT THREAT FOR THURSDAY IS LOW. BUT...REMEMBER EVEN WHEN THE RIP
CURRENT IS THREAT IS LOW...RIP CURRENTS CAN STILL
OCCUR...ESPECIALLY NEAR INLETS...JETTIES AND SANDBARS.

SURF TEMPERATURES AT SELECTED LOCATION...

CAPE MAY NJ...58...
OCEAN CITY MD...58...
VIRGINIA BEACH VA...63...
KILL DEVIL HILLS...60...
DUCK...61...

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APPENDIX B - Definitions and General Terminology

This section contains meteorological terms that can be utilized in a zone forecast package. Please refer to other sources (e.g., pertinent procedural directives, The Glossary of Meteorology, 2nd edition, published by the American Meteorological Society, etc.) for more details or terms not defined here.

Areas: Areal coverage of non-measurable, non-convective weather and/or restrictions to visibility affecting 25 to 50 percent of a forecast zone(s).

Blowing Snow: Snow lifted from the surface of the earth by the wind to a height of 6 feet or more above the ground, and blown about in such quantities that horizontal visibility is reduced to less than 7 statute miles.

Drifting Snow: Snow raised from the surface of the earth by the wind to a height of less than 6 feet.

Drizzle: Very small (diameters of less than 0.02 inch), numerous, and uniformly distributed water drops that may appear to float while following air currents. Unlike fog droplets drizzle falls to the ground.

Dry Thunderstorm: A storm produced by a cumulonimbus cloud(s) accompanied by lightning, gusty wind, and little or no precipitation (i.e., 0.10 inch or less).

Duststorm: A severe weather condition characterized by poor visibility (5/8 of a mile or less), strong wind and dust-filled air over a widespread area.

Fog: A visible aggregate of minute water droplets near the earth's surface which reduces horizontal visibility and, unlike drizzle, does not rapidly fall to the ground.

Freeze: Conditions when the temperature at or near the surface is expected to be 32 degrees F or below.

Freezing Rain/Drizzle: Rain/drizzle that falls in liquid form but freezes on contact to form a coating of glaze upon the ground and on other exposed surfaces.

Frost: The formation of thin ice crystals on a cold object, such as a window or bridge, that forms by direct deposition of water vapor to solid ice.

Haze: A suspension in the air of extremely small, dry particles which, individually, are invisible to the naked eye. When numerous, they can restrict visibility.

Long Duration Hazardous Weather: Weather events in effect for three hours or more that may endanger life or property, or provide an impediment to commerce. These weather events warrant the issuance of a NWS watch, warning, or advisory.

Measurable Precipitation: 0.01 inches or greater of liquid precipitation or water equivalent of frozen precipitation.

Opaque cloud cover: The amount (in oktas) of cloud cover (sheet, layer or patch) which is sufficiently dense to completely hide or obscure anything (e.g., sun, moon, higher cloud layer) that might be above it.

Patchy: Areal coverage of non measurable, non-convective weather and/or restrictions to visibility affecting less than 25 percent of a forecast zone(s).

Precipitation Event: The occurrence of measurable precipitation within the area covered by the zone forecast group during a specified time period.

Probability of Precipitation (POP): The likelihood, expressed as a percent, of a measurable precipitation event (0.01") at a particular point during a specified time period.

Rain: Liquid precipitation, either in the form of drops larger than 0.02 inch, or smaller drops which, in contrast to drizzle, do not appear to float while following air currents.

Sandstorm: Particles of sand carried aloft by a strong wind. The sand particles are mostly confined to the lowest ten feet, and rarely rise more than fifty feet above the ground.

Showers: Precipitation characterized by the suddenness with which it starts and stops, by the rapid changes of intensity, and usually by rapid changes in the appearance of the sky.

Significant Weather: Weather conditions that do not meet NWS watch, warning or advisory criteria, but have an impact on people's health and well-being. Such weather may affect decisions ranging from the choice of appropriate clothing, to the planning of a major event. Examples of Significant Weather include:

Precipitation conditions:

1. Heavy rain (Large ponding/localized flooding)
2. Short duration (less than three hours) heavy snow event
3. Dry thunderstorms, especially during the summer fire season
4. Thunderstorms with frequent lightning and/or small hail
5. Snow accumulations

Non-Precipitation conditions:

- ▶ Persistent humid or dry conditions
- ▶ Rip currents

Temperature conditions:

- ▶ Record lows or highs
- ▶ Notable Wind chill/Heat Index values
- ▶ Large and/or rapid drop/rise in temperature

Wind conditions:

- ▶ Short duration convective or non-convective strong wind events (e.g., gust fronts, frontal passages)
- ▶ Sea breezes
- ▶ Foehn winds

Sleet (ice pellets): Generally frozen raindrops (or refrozen melted snowflakes) which usually bounce when hitting a hard surface. Sleet does not "stick" to exposed surfaces.

Snow: Frozen precipitation in the form of (white or translucent) ice crystals.

Snow Flurries: Intermittent, short duration snowfall with little or no accumulation.

Snow Showers: Intermittent, short duration snowfall, with possible accumulation.

Snow Squalls: Intense snowfall, accompanied by gusty surface wind and possibly lightning (generally moderate to heavy snow showers). Accumulation may be significant.

Sprinkles: Scattered droplets of unmeasurable rain.

Thunderstorm: A local storm produced by a cumulonimbus cloud(s) accompanied by lightning and thunder, usually with gusts of wind, heavy rain, and sometimes with hail.

Widespread: Areal coverage of non-measurable, non-convective weather and/or restrictions to visibility affecting more than 50 percent of a forecast zone(s).

APPENDIX C - Federal Meteorological Handbook No. 1

The following web link will access the latest edition of Federal Meteorological Handbook No. 1(FMH-1), "Surface Weather Observations and Reports" which embodies the United States conversion to the World Meteorological Organization's (WMO) Aviation Routine Weather Report/Aviation Selected Special Weather (METAR/SPECI) code formats. It was compiled under the auspices of the Office of the Federal Coordinator for Meteorological Services and Supporting Research and embodies the work of meteorological code experts from the United States Departments of Commerce, Transportation, Defense, and Energy. The FMH-1 incorporates all of the United States' exceptions to the international METAR/SPECI format standard that is prescribed in the World Meteorological Organization's Publication No. 306 on Meteorological Codes.

- ▶ FMH-1, Surface Weather Observations and Reports and Related Pen and Ink Changes:
<http://www.ofcm.gov/fmh-1/fmh1.htm>

APPENDIX D - US Department of Transportation FAA 7340.1[x] Contractions

The following web link will access the list of official USA-AERONAUTICAL CONTRACTIONS. These approved word and phrase contractions are used by personnel of the Federal Aviation Administration (FAA). This list is also used by other agencies (including the NWS) that provide air traffic control, communications, weather, charting, and associated services.

- ▶ FAA Contractions: <http://www.faa.gov/ATPUBS/CNT/2-1.HTM>

